Amendment 2

to the

MONKFISH FISHERY MANAGEMENT PLAN

Including a Final Supplemental Environmental Impact Statement (DSEIS), Regulatory Impact Review, and Stock Assessment and Fishery Evaluation (SAFE) Report for the 2002 Fishing Year

Prepared by the
New England Fishery Management Council
Mid-Atlantic Fishery Management Council
National Marine Fisheries Service

DSEIS Submitted by NEMFC: 3/19/04 (revised 4/16/04)
FSEIS Submitted by NEMFC: 11/19/04 (rev. 12/9/04)

ERRATA SHEET FOR THE FSEIS FOR AMENDMENT 2 TO THE MONKFISH FISHERY MANAGEMENT PLAN

Section 4.1.8.2. (page 41) Replace "…six of these species overlap with the two areas proposed for closure, including pollock, redfish, whiting (silver hake), clearnose skate, and tilefish" with "six of these species (redfish, tilefish, and four species of skates) overlap with the two proposed area closures".

Section 5.4.1.3. (page 255)
1. "…. and 10 (instead of 5) of them occupy hard substrates in depths >200m."

2. Replace the 3 species summaries listed under this section with the 3 species summaries in Section 6.3.1.5.3, page 329.

COVER SHEET

RESPONSIBLE AGENCIES:

Assistant Administrator for Fisheries
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

New England Fishery Management Council
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Newburyport, MA 01950

Mid-Atlantic Fishery Management Council
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PROPOSED ACTIONS:

Adoption, approval, and implementation of Amendment 2 to the Monkfish Fishery Management Plan.

FOR FURTHER INFORMATION CONTACT:

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TYPE OF STATEMENT:

() DRAFT (X) FINAL

ABSTRACT:

The New England Fishery Management Council, the Mid-Atlantic Fishery Management Council and the NOAA Assistant Administrator for Fisheries propose to adopt, approve, and implement Amendment 2 to the Monkfish Fishery Management Plan (FMP) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (the Act). The FSEIS presents the details of a management program designed to ensure compliance with the Act. It proposes measures to address a wide range of management issues, to resolve problems in the fishery that have arisen as a result of the implementation of the original FMP in 1999, and to minimize bycatch and adverse fishery impacts on essential fish habitat, to the extent practicable, while achieving optimum yield from the fishery during the stock rebuilding program.

DATE BY WHICH COMMENTS MUST BE RECEIVED: ____________________

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TABLE OF ACRONYMS

A	Adult life stage
A13	Amendment 13 to the Multispecies FMP
ALWTRP	Atlantic Large Whale Take Reduction Plan
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CA I	Closed Area I under the Multispecies FMP
CA II	Closed Area II under the Multispecies FMP
DAM	Dynamic Area Management
DAS	days-at-sea
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DSEIS	Draft Supplemental Environmental Impact Statement
E	Egg life stage
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FMP	fishery management plan
FW	Framework
FW 13	Framework 13 to the Scallop FMP
FY	fishing year
GB	Georges Bank
GOM	Gulf of Maine
GRT	gross registered tons/tonnage
HAPC	habitat area of particular concern
HCA	Habitat Closed Area
HPTRP	Harbor Porpoise Take Reduction Plan
IFQ	individual fishing quota
IWC	International Whaling Commission
J	Juvenile life stage
LOA	letter of authorization
MA	Mid-Atlantic
MAFMC	Mid-Atlantic Fishery Management Council
MMC	Monkfish Monitoring Committee
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSMC	Multispecies Monitoring Committee
MSY	maximum sustainable yield
NAAA	Northwest Atlantic Analysis Area
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office

NFMA	Northern Fishery Management Area
NLCA	Nantucket Lightship Closed Area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OY	optimum yield
PBR	Potential Biological Removal
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SAFE	Stock Assessment and Fishery Evaluation
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SFMA	Southern Fishery Management Area
SIA	Social Impact Assessment
SMAST	U. Mass. Dartmouth School of Marine Science and Technology
SNE	southern New England
SNE/MA	southern New England-Mid-Atlantic
SSB	spawning stock biomass
TAC	total allowable catch
TED	turtle excluder device
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	vessel trip report
YPR	yield per recruit

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1.0 INTRODUCTION

1.1 Executive Summary

This document presents the New England and Mid-Atlantic Fishery Management Councils' (Councils', NEFMC and MAFMC, respectively) goals and objectives for modifying the jointly managed Monkfish Fishery Management Plan (FMP), the proposed action and alternatives considered but not adopted to achieve those goals and objectives, and the analysis of expected impacts of each alternative. As discussed in Section 2.0, Background and History, the amendment is necessary to address a number of issues that arose out of the implementation of the original FMP, including displacement of some vessels from their established monkfish fisheries and permit qualification for vessels in the southern end of the range of the fishery; to address deficiencies in meeting Magnuson-Stevens Act requirements, particularly as identified in several court decisions pertaining to protection of essential fish habitat and reducing bycatch; and to reduce scientific uncertainty about the biology and population dynamics of monkfish and the optimal gear configurations for minimizing bycatch, protected species interactions and habitat effects. The amendment, along with its associated analyses, is also necessary to update the environmental impact statement for the FMP that was originally prepared in 1998.

To address those needs, the Councils adopted a set of specific Goals and Objectives for the amendment, as detailed in Section 3.0. In summary, those goals are:

- **I.** Prevent overfishing or rebuild overfished stocks as necessary.
- **II.** Address problems created by the implementation of the FMP.
- **III.** Promote improved data collection and research on monkfish
- **IV.** Comply with CEQ (Council on Environmental Quality) Guidelines to update Environmental Documents
- **V.** Address deficiencies in meeting Magnuson Act requirements
- **VI.** Address protected resources/fishery interactions, and
- **VII.** Reduce FMP complexity where possible.

Starting with a public scoping process in December 2001, the Councils, and the Industry Advisory Panel and Monkfish Oversight Committee, developed through a series of public meetings, a range of alternatives designed to address the stated goals and objectives. During 2003 and early 2004 the Monkfish Committee and the Council staff completed the development of the alternatives and preparation of the Draft Supplemental Environmental Impact Statement (DSEIS).

The Councils published a Notice of Availability of the DSEIS on April 30, 2004 (*69 Federal Register 23571*) and held public hearings between June 15 and June 24, 2004 in six locations between North Carolina and Maine. Following the close of the public comment period on July 28, the Industry Advisory Panel and Monkfish Overisight Committee, as well as the NEFMC's Habitat Committee met to review public comment and recommend final measures. The NEFMC met in September, and the MAFMC in October to approve final measures to be submitted to the Secretary of Commerce for implementation by the May 1 start of the 2005 fishing year.

The proposed action comprises 14 measures that address the range of goals outlined in Section 3.0 and issues identified in the scoping and amendment development process. These measures, as well as the corresponding no-action alternatives, are summarized below in Table 1, and described in detail in Section 4.1. In addition to the proposed actions described in that table, the Councils are taking no action on four measures considered in the DSEIS (separation of DAS usage requirements, monkfish trawl minimum mesh size, NFMA experimental fishery, and changing the fishing year). The alternatives considered by the Councils in the DSEIS but not adopted are described in Section 4.2.2, along with a rationale for their disapproval. Appendix I contains a summary table of all the alternatives with their respective impacts and issues as presented in the DSEIS.

The proposed action is not likely to have significant impacts on the human environment, as discussed in Section 6.0, Environmental Consequences. The impacts of each measure, compared to the no-action alternative, are summarized below for biological impacts on monkfish and other managed species (Table 2) and protected species (Table 3), fishery impacts on habitat (Table 4), and socio-economic impacts (Table 5). In addition, the cumulative effect of the proposed action and all other past, present and reasonably foreseeable future actions on these environmental components is discussed in Section 6.6.

Of particular note in this amendment, is the proposal to close two offshore canyons to vessels fishing on a monkfish DAS. When the FMP was implemented in 1999, the offshore monkfish fishery that developed along the edge of the continental shelf was no longer profitable due to the restrictiveness of the trip limits and DAS usage requirements. A number of industry members who fished in that offshore fishery worked with the Councils to re-establish the fishery in a way that would be profitable for the participating vessels while being equitable with non-participating vessels and consistent with the rebuilding program. Since the offshore fishery takes place along the edge of the continental shelf where deep-sea corals exist, the Councils are proposing to close the deeper portions of two offshore canyons on the southern edge of Georges Bank where corals have been observed as a precautionary measure that minimizes the economic impact on the fishery as the offshore fishery becomes established, and as advances in deepwater fishing technology enable vessels to extend their activity into the canyon areas. The benthic life stages of six managed species that inhabit these two canyons utilize EFH that is adversely impacted by bottom trawls. While corals are not strictly part of the essential fish habitat (EFH) designation for any managed species in the region, protecting corals from the adverse effects of bottom trawls and gill nets may also indirectly benefit other managed species that occupy the closed areas, or species with EFH in adjacent areas.

Since a major part of the impetus to undertake this amendment is a court order pursuant to a lawsuit challenging the EFH provisions of the original FMP (*AOC v. Daley* , see Section 2.5.2.2), the Councils considered a range of alternatives to meet the goal and mandate to minimize, to the extent practicable, the effect of the fishery on EFH. The gear effects evaluation and adverse impacts determination (see Appendix II) has concluded that trawl gear (but not gillnets) used in the monkfish fishery, has an adverse impact on the EFH of some other species, however, gears used in the monkfish fishery and other fisheries have a low impact on monkfish EFH. In addition to the aforementioned canyon area closures and a monkfish trawl roller restriction, the Councils are assessing the effect of other measures in this amendment, measures in the current FMP (the no action alternative), and actions taken in recent amendments to the Multispecies and Sea Scallop FMPs, Amendments 13 and 10, respectively, for their efficacy in minimizing the effect of the monkfish fishery on EFH of other species. Since the majority of vessels in the monkfish fishery are also involved in either the scallop or multispecies fisheries, the EFH protection measures in those amendments will directly effect how the monkfish fishery interacts with the EFH for those species.

Another major impetus for the amendment is the disqualification for a limited access permit under the original FMP for a number of monkfish vessels at the southernmost range of the fishery, off the North Carolina and Virginia coasts for reasons outlined in Section 4.1.5. To address this issue, the Councils are proposing to modify the limited access permit qualification criteria and to limit any newly qualifying vessels to fishing for monkfish to the area south of 38°20'N. Of the four action alternatives considered, the Councils propose one that is expected to qualify five vessels for a limited access permit, enabling them to fish for monkfish in the EEZ. The impact of this action on the resource or the fishery is not likely to be significant, especially considering the small number of affected vessels, the area restrictions placed on those newly qualifying vessels, the limited season of the fishery in that area, and the measures in place to protect sea turtles from entanglement. Admitting these vessels into the limited access program could have a modestly positive effect on the communities where those vessels operate as a result of the potential additional revenue and diversification that would result.

Two main issues identified in the scoping process remain unresolved by this amendment (see Section 8.1.4), the restrictiveness of current regulations to protect sea turtle interactions on gillnet vessels off the North Carolina/Virginia coast, and completion of the mandatory five-year review of the elements in the FMP pertaining to EFH requirements of the Magnuson-Stevens Act, such as EFH designation and consideration of Habitat Areas of Particular Concern (HAPCs). The Councils considered including in this amendment alternative approaches to the sea turtle protection measures implemented by NMFS under the authority of the Endangered Species Act, but the needed analysis was not completed in time to be used to develop appropriate management measures for this document. The Councils may take action in the future under the framework adjustment process. With regard to the EFH issues, the New England Council is initiating an omnibus amendment to all its FMPs (Amendment 3 to the Monkfish FMP) that will address those and other habitat issues.

Proposal	Details	No Action (Current Rules)
Incidental Catch – 50 lbs./day, 150 max.	Applies on all vessels not on a DAS and fishing with small mesh, and handgear, includes multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used.	50 lbs. possession limit, regardless of trip length.
Incidental Catch – GC scallop dredge and surf clam dredge vessels	Applies incidental limit above.	No monkfish possession allowed.
Incidental Catch – Summer flounder vessels west of 72°30'W	Restores incidental limit of 5% total weight on board, adds 450 lbs. (tail wt.) cap	50 lbs. possession limit,; or 50 lbs./day, 150 max. under Amendment 2 revision above
Minimum Fish Size	11" tail, 17" whole, both areas	NFMA - No change SFMA - 14" tail, 21" whole
Closed Season	Eliminate April – June 20-day block out requirement on Category A and B vessels	Category A & B vessels: April – June, 20-day block out of the fishery; Category C & D (Multispecies): March – May, 20-day block (per MS FMP) Category C & D (Scallop): no requirement
Offshore SFMA Fishery Program	Enrollment program; Oct. – April; 1,600 lbs. (tail) per DAS; pro – rated DAS allocations; VMS; Category A & B gear requirement; (see text for area and other details)	Vessels subject to permit category trip limits
Modification of Permit Qualification – South of 38°N	Vessels qualify for limited access permit with landings south of 38°N, during 3/15 – 6/15, 1994-1998; 50,000 lbs. (tail) for Category A or C permit; 7,500 lbs. for Category B or D; may only fish for monkfish south of 38°20'N	Vessels do not qualify for limited access permit
Modify the Framework Adjustment Procedure	Framework adjustments can be done to implement transferable MF DAS; measures to minimize impact on protected species; or bycatch reduction devices	These actions would require plan amendment
NAFO Regulated Area Exemption Program	Vessels exempt from permit, mesh size, effort control and possession limit rules while fishing under High Seas Permit in NAFO Area; landings do not count against TAC	Vessels must comply with MF FMP regulations
EFH – SFMA Roller Gear Restriction	6" max. diameter trawl roller gear in SFMA on MF DAS	No restriction
EFH – Canyon Area closures	Vessels on a MF DAS prohibited from fishing in Oceanographer and Lydonia Canyons (see text for area description)	No restriction
Cooperative Research – DAS set aside	Vessels responding to cooperative research RFP may be allocated MF DAS; pool of 500 DAS deducted from total DAS allocation	No DAS allocated for cooperative research
Cooperative Research – DAS exemption	Vessels applying for MF cooperative research may obtain exemption from DAS usage requirements; available DAS limited to residual of DAS set-aside pool after RFP awards	Vessels may seek exemption from DAS for cooperative research; must complete Environmental Assessment
Clarification of Vessel Baseline	Vessel length, tonnage and horsepower baseline to be set at those of first federal permit; only on request of vessel owner during first year after implementation	Vessels may have dual baselines, if permit transferred to another vessel between issuance of first permit and MF limited access permit

Table 1 Summary of Amendment 2 proposed action and corresponding no-action alternatives

Proposal	Biological Impacts (compared to no action)	
	Monkfish	**Other Managed Species**
Incidental Catch – 50 lbs./day, 150 max.	No impact – incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No impact
Incidental Catch – GC scallop and surf clam dredge vessels	No impact – incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No impact
Incidental Catch – Summer flounder vessels west of 72°30'W	No impact – incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No impact
Minimum Fish Size	Could have a minor impact on yield-per-recruit if vessels target smaller monkfish in SFMA. No impact if measure simply converts discards to landings. Improved catch-at-age data.	No impact
Closed Season	No impact. Spawning area closure (no action) has no apparent biological benefit.	No impact
Offshore SFMA Fishery Program	May shift effort from inshore to offshore stock component with no overall increase in effort. May also result in some overall effort increase compared to no action if vessels participate who are not currently active in MF fishery (cannot predict the amount of participation by such vessels). Unsustainable effort increases can be mitigated by adjustment to trip limits and/or DAS allocations in subsequent years.	Could reduce impact on inshore and multispecies stocks by vessels shifting effort to offshore monkfish, where catch of other species is minimal. Category C and D multispecies vessels will use multispecies DAS while fishing in the offshore program (and, therefore, not have those DAS available to target multispecies).
Modification of Permit Qualification – South of 38°N	May shift effort from inshore (state waters) to offshore grounds with no overall effort increase. May also result in some effort increase compared to no action if vessels participate who are not currently active in MF fishery (<5 vessels expected). Overall potential effort limited by season/area. Effort increases can be mitigated by trip limits and/or DAS adjustment in subsequent years.	No impact likely, since any resulting effort shifts are limited seasonally and by area.
Modify the Framework Adjustment Procedure	No direct impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.	No direct impact since no action is being taken. If and when a action is proposed, impacts of specific measures would be analyzed.
NAFO Regulated Area Exemption Program	No direct impact on domestic stocks. Could result in increase in effort on NAFO Area stocks, limited greatly by logistical considerations.	No impact
EFH – SFMA Roller Gear Restriction	No impact. Vessels targeting monkfish already use this gear, which is intended to prevent expansion of the fishery into complex bottom types, especially offshore canyon areas.	No direct impact but could be positive on species inhabiting complex habitats, particularly offshore canyons by limiting ability to trawl in those areas.
EFH – Canyon Area closures	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	Same as impact on monkfish.
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Same as impact on monkfish.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Same as impact on monkfish.
Clarification of Vessel Baseline	No impact. This is an administrative change.	No impact. This is an administrative change.

Table 2 Summary of biological impacts of the proposed action.

Proposal	Protected Species Impacts (compared to no action)
Incidental Catch – 50 lbs./day, 150 max.	No impact – alternatives including no action will not affect protected species interactions
Incidental Catch – GC scallop dredge and surf clam dredge vessels	No impact
Incidental Catch – Summer flounder vessels west of 72°30'W	No impact
Minimum Fish Size	No impact (including no action) – does not affect magnitude or distribution of effort
Closed Season	Could have a negative impact on protected species, but not clearly or significantly, since varying amounts of gear is still deployed during this period under no action.
Offshore SFMA Fishery Program	Would likely have a positive impact, or at least mitigate impacts on protected species since overall effort (DAS) is reduced under proposed action, and vessels must use VMS which will improve information regarding protected species interactions, to the extent they occur offshore.
Modification of Permit Qualification – South of 38°N	Impact expected to be minimal due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and established sea turtle closures.
Modify the Framework Adjustment Procedure	No direct impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed. Indirectly proposed action could have a positive impact because it will allow for timely action to address protected species issues if, and when they arise.
NAFO Regulated Area Exemption Program	No significant impact expected due to small number of vessels capable of participating, and also that such an exemption already exists in the Multispecies FMP.
EFH – SFMA Roller Gear Restriction	No impact – sets a maximum diameter equivalent to size currently in use; prevents expansion of trawl effort into complex bottom areas and canyons at continental margin.
EFH – Canyon Area closures	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas and may have some positive (preventative) impact on offshore protected species.
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could have a positive impact if research results in measures that reduce interactions with protected species.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could have a positive impact if research results in measures that reduce interactions with protected species.
Clarification of Vessel Baseline	No impact. This is an administrative change.

Table 3 Summary of impacts of the proposed action on protected species.

Proposal	Habitat Impacts (compared to no action)
Incidental Catch – 50 lbs./day, 150 max.	No impact
Incidental Catch – GC scallop dredge and surf clam dredge vessels	No impact
Incidental Catch – Summer flounder vessels west of 72°30'W	No impact
Minimum Fish Size	No impact (including no action) – does not affect magnitude or distribution of effort
Closed Season	No impact – Short time of closure period under no action is not significantly different, in terms of habitat impacts than proposed elimination of closed season.
Offshore SFMA Fishery Program	No impact, or slightly negative. May affect deep water benthic habitats on the edge of the continental shelf by enabling vessels to return to traditional areas. Potential exists for some interaction if vessels expand the range of their operations beyond historical areas. EFH Alt. 5AB, roller gear restriction and pro-rated DAS on enrolled vessels contribute to mitigate these potential effects.
Modification of Permit Qualification – South of 38°N	No, or minimal impact due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and that probable qualifiers are all vessels that fish exclusively with gillnets.
Modify the Framework Adjustment Procedure	No impact since this is administrative, and no immediate action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.
NAFO Regulated Area Exemption Program	No impact due to small number of vessels capable of participating, and also that such an exemption already exists in the Multispecies FMP.
EFH – SFMA Roller Gear Restriction	Positive but not a significant impact – sets a maximum roller gear diameter equivalent to size currently in use in the area; prevents expansion of trawl effort into complex bottom areas and canyons at continental margin.
EFH – Canyon Area closures	Positive but not a significant habitat impact since minimal monkfish fishing occurs in those areas (preventative measure).
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could have a positive impact if research results in measures that minimize habitat impacts.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could have a positive impact if research results in measures that minimize habitat impacts.
Clarification of Vessel Baseline	No impact. This is an administrative change.

Table 4 Summary of impacts of the proposed action on habitat.

Proposal	Socio-Economic Impacts (compared to no action)	
	Economic	**Social**
Incidental Catch – 50 lbs./day, 150 max.	Likely slightly positive due to increased allowable landings, but difficult to quantify with available data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – GC scallop dredge and surf clam dredge vessels	Likely slightly positive due to increased allowable landings, but difficult to quantify with available data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – Summer flounder vessels west of 72°30'W	Slightly positive. Average benefit to 114 vessels of $825 annually, ranging from $0 to about $10,000.	Slightly positive due to reduced discards and improved profitability.
Minimum Fish Size	Likely slightly positive, including reduced enforcement costs, but difficult to quantify with available data.	Slightly positive due to reduced discards and improved profitability.
Closed Season	Likely slightly positive, due to reduced regulatory burden/enforcement costs, but difficult to quantify with available data.	Slightly positive due to increased flexibility on Category A and B vessels.
Offshore SFMA Fishery Program	Likely positive due to higher profitability. Participation is voluntary, so presumably enrolled vessels anticipate positive economic effects.	Positive for larger vessels able to fish offshore due to higher profitability, and restores a pre-FMP fishery
Modification of Permit Qualification – South of 38°N	Likely positive for qualifying vessels, but unknown for rest of fleet.	Positive for the small number of affected vessels due to increased opportunity and value of vessel permit, and their communities.
Modify the Framework Adjustment Procedure	No impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.	No impact since no action is being taken. If and when a framework adjustment is proposed, impacts of specific measures would be analyzed.
NAFO Regulated Area Exemption Program	Likely positive due to increased flexibility, but cannot be quantified.	Likely positive due to increased flexibility, but cannot be quantified.
EFH – SFMA Roller Gear Restriction	Could have short-term negative impact on vessels not already using this gear, although most already are. Could limit future expansion of the fishery into complex bottom areas. Cannot be quantified.	Slightly negative for vessels not already using this gear, otherwise neutral.
EFH – Canyon Area closures	No impact. Vessels targeting monkfish do not fish in these areas.	No impact likely. Vessels targeting monkfish do not fish in these areas.
Cooperative Research – DAS set aside	Would negatively impact those vessels that use their entire MF DAS allocation, but could be recouped, or even be positive if those vessels engaged in coop research under this program.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry "buy-in" to science supporting management.
Cooperative Research – DAS exemption	Would negatively impact those vessels that use their entire MF DAS allocation, but could be recouped, or even be positive if those vessels engaged in coop research under this program.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry "buy-in" to science supporting management.
Clarification of Vessel Baseline	No impact on vessel earnings, but could affect value of vessel permits.	Unknown social impact, or slightly positive since any adjustment is at vessel owner's request only.

Table 5 Summary of economic and social impact of proposed action.

1.2 Document Organization

This document incorporates information required to meet the requirements of FMP amendments under the Magnuson-Stevens Act in a format that integrates the requirements of National Oceanic and Atmospheric Administration (NOAA, the parent agency to NMFS) guidelines for Supplemental Environmental Impact Statements (SEIS) to meet the mandates of the National Environmental Policy Act (NEPA). The document also contains sections explicit to a number of other applicable federal laws and executive orders. Thus, the document is divided into the following sections:

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3. Introduction and Summary (Section 1.0)
4. Background, Purpose and Need (Section 2.0)
5. Goals and Objectives (Section 3.0)
6. ProposedAction and Alternatives (Section 4.0)
7. Affected Environment (Section 5.0)
8. Environmental Consequences (Section 6.0)
9. Magnuson-Stevens Act Consistency (Section 7.0)
10. Consistency with Other Applicable Law (Section 8.0)
11. Appendices

Information contained in the Affected Environment section of the SEIS also serves as the Council's annual Stock Assessment and Fishery Evaluation (SAFE) Report for the 2002 fishing year, ending April 30, 2003. (The 2003 SAFE report is being incorporated into a separate document supporting the annual adjustment for the 2005 fishing year). Appendix I contains a summary table of the alternatives that wereunder consideration in the DSEIS, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.2 that each preferred alternative addresses. Appendix I has a second table that identifies the alternatives recommended by the Industry Advisory Panel and the Monfkish Committee and summarizes their respective comments following the DSEIS public comment period. Appendix II contains a summary of the Habitat Considerations – Gear Effects, incorporating information from the NMFS, NEFMC and MAFMC-sponsored Gear Effects Workshop that evaluated the effects of fishing gears used in the Northeast Region. Appendix III contains DSEIS public hearing summaries, written comments, summary of comments and the Councils' response.

2.0 BACKGROUND, PURPOSE AND NEED

2.1 History of the Fishery

Until relatively recently, monkfish (goosefish or angler) was an incidental catch in groundfish and sea scallop fisheries but had little or no commercial value. In the 1960's reported landings averaged less than a million pounds and revenues from monkfish were a few hundred thousand dollars a year. During the 1970's, however, a ten-fold increase in the price of tails lead to a 17-fold increase in trips reporting landings, and in landings themselves, as gillnet and sea scallop fishermen joined trawlers in reporting landings. Further growth in the demand for tails by Europe and livers by Japan and other Asian countries (South Korea in particular) fueled growth of U.S. dockside markets into the 1990s.

In the early 1990's, fishermen and fish dealers expressed their concern about the fishery to the New England and Mid-Atlantic Fishery Management Councils. They cited the increasing proportion of small fish being targeted and, as the directed trawl fishery expanded into areas not previously fished by groundfish vessels, the growing frequency of gear conflicts between monkfish and other fisheries vessels, particularly the offshore lobster fishery.

2.2 FMP Development and Implementation

In response to those industry concerns, and scientific evidence that the stocks were under increasing pressure, such as declining survey indices and decreasing proportion of large fish in the commercial catch, the Councils jointly initiated efforts to develop an FMP with the publication in 1993 of a notice initiating the scoping process to gather public comment on issues and potential management strategies (58 *Federal Register* 7879, February 10, 1993). The Councils viewed the situation against a backdrop of rapidly rising prices for monkfish tails and livers, as well as the development of restrictive management programs in many of the region's fisheries that could potentially cause vessels to shift into the unrestricted and profitable monkfish fishery, further exacerbating the stock decline.

To discourage speculative entry into the fishery as they developed the FMP, which included a potential limited entry program, and to promote awareness of potential permit eligibility criteria, the Council published a control date on February 17, 1995 (60 *Federal Register* 10574, February 27, 1995). The Councils held public hearings took place in 1997 and again in 1998 as the plan was being finalized. The Councils submitted the FMP to NMFS on September 17, 1998. NMFS published the proposed rule on February 16, 1999 and the final rule on October 7, with an effectiveness date for implementation of November 8, 1999. The FMP contains the following measures:

- multi-level limited access program
- two management areas (see Figure 1)
- target TACs
- effort limitations (DAS)
- trip limits

- bycatch allowances
- minimum fish sizes and minimum mesh size
- gear restrictions
- spawning season closures
- a framework adjustment process
- permitting and reporting requirements
- other measures for administration and enforcement.

In recognition of the fact that much of the growth of the monkfish fishery was attributable to multispecies and scallop vessels landing monkfish caught either incidentally or as directed effort during fishing trips that were under multispecies or scallop DAS, the Councils adopted a two-tiered permit program, in which qualifying vessels that also held a multispecies or scallop limited access permit would be required to use a DAS in those respective fisheries while on a monkfish DAS. The original FMP contained a four-year phase in of management measures to reduce fishing effort and rebuild the stocks within ten years or less. Year 1 of the plan began May 1, 1999 the scheduled start of the fishing year, even though the FMP was not implemented until six months into the fishing year. An analysis by NMFS in 2000, however, concluded that even if the Year 1 measures had been implemented on May 1, 1999, the quota for the SFMA would have been exceeded. Consequently, the Council made no adjustment to the default regulations for Year 2 or Year 3. These regulations allocated 40 DAS for directed fishing for monkfish and imposed a trip limit by permit category and gear type. For vessels fishing in the NFMA, other than scallop dredge vessels, the regulations imposed no trip limit during Years 2 and 3, regardless of whether a vessel is on a monkfish or multispecies-only DAS.

For Year 4, starting May 1, 2002, the FMP regulations included default measures that eliminated the directed fishery (zero DAS) and reduced bycatch trip limits, unless modified during the Year 3 review and adjustment process. The default measures were postponed by Framework 1/NMFS Emergency Rule in 2002, and removed from the FMP by Framework 2 in 2003, see discussion below.

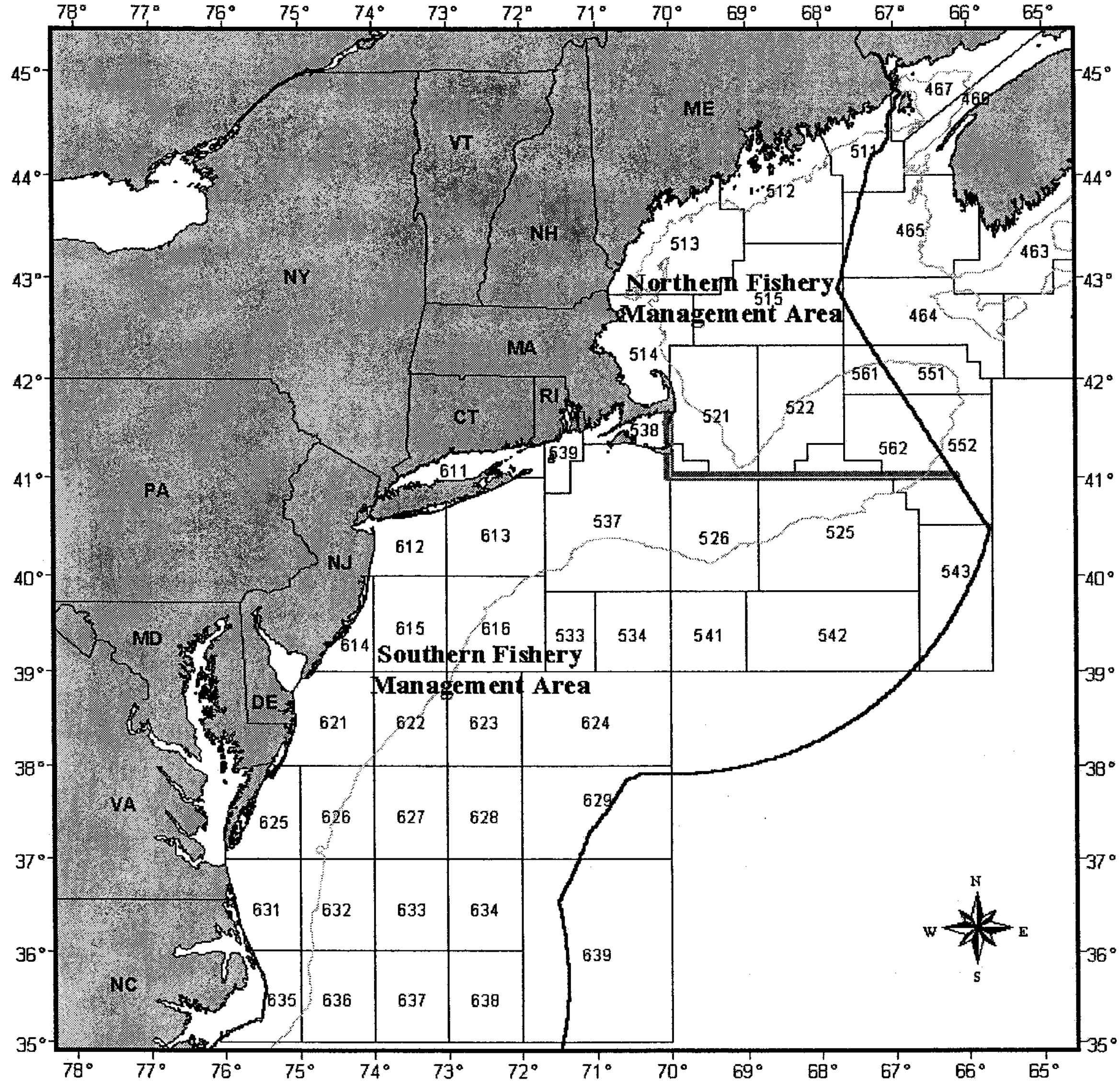


Figure 1 Monkfish fishery management areas map, showing 3-digit statistical areas.

2.3 Amendment 1

Amendment 1 was part of an omnibus amendment for multispecies, sea scallops, Atlantic salmon and monkfish FMPs submitted by the Council to comply with the Essential Fish Habitat (EFH) requirements of the Magnuson-Stevens Act (MSA). NMFS approved Amendment 1 on April 22, 1999.

2.4 Magnuson-Stevens Act Provisions on Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) required the National Marine Fisheries Service (NMFS) and regional Fishery Management Councils (Councils) to describe and identify essential fish habitat (EFH) within fishery management plans, minimize to the extent practicable adverse effects on EFH caused by fishing, and identify other actions to encourage the conservation and enhancement of EFH. EFH is defined in the Magnuson-Stevens Act as *"those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."*

As required by the Magnuson-Stevens Act, NMFS developed guidelines at 50 CFR part 600, Subpart J, to assist the Councils in the description and identification of EFH and in the consideration of actions to ensure the conservation and enhancement of EFH. Section 600.815(a)(9) recommends that Councils identify habitat areas of particular concern (HAPCs) within EFH to provide greater focus for conservation and enhancement efforts. HAPCs are subsets of EFH that are especially important ecologically, sensitive to human-induced environmental degradation, stressed by development activities, and/or rare. This EIS does not include the consideration of new descriptions and identifications of EFH and new HAPCs, as the Councils will take that action in the Council's upcoming Omnibus Habitat Amendment. The NEFMC published a Notice of Intent (69 *Federal Register* 8367, February 24, 2004) and expects to complete the amendment in 2005 (see Section 2.5.2.2 below). For the purposes of this Plan Amendment, the existing and approved EFH designations and HAPCs from the Amendment 1 to the Monkfish FMP of 1998 will continue. The EFH regulations include guidelines for identifying adverse impacts from both fishing and non-fishing activities and considering the practicability of actions for minimizing adverse effects on EFH from fishing.

2.5 Fishing Years 2 and 3

2.5.1 Stock Assessments

The Northeast Fisheries Science Center conducted two monkfish stock assessments during the initial years of FMP implementation. Another assessment is scheduled for the November, 2004.

2.5.1.1 SAW 31

The 31st Stock Assessment Workshop (SAW 31), July 2000, provided the Councils with an assessment of monkfish through calendar year 1999, prior to the implementation of the FMP. SAW 31 concluded that both stocks were overfished and that overfishing was occurring, and advised that fishing mortality should be reduced. SAW 31 could not reliably estimate fishing mortality, however, and did not provide projections of stock dynamics under various assumptions of fishing mortality. The SAW also recommended that both fishing mortality rate and biomass status determination criteria in the FMP be reevaluated for consistency with NMFS' National Standards Guidelines, and for attainability with respect to the control rules implied by the FMP.

2.5.1.2 SAW 34/Cooperative Survey

The 34th Stock Assessment Workshop (SAW 34), January 2002, provided the Councils with an updated monkfish assessment through calendar year 2000, and incorporated data collected during the Cooperative Goosefish Survey, February – May 2001 to estimate fishing mortality rates. SAW 34 concluded that both northern and southern stocks were overfished, and overfishing was occurring in 2000. Despite the additional data collected during the cooperative survey, SAW 34 did not provide a point estimate for either fishing mortality or biomass, nor did it provide projections of stock size under various assumptions of fishing mortality. SAW 34 provided a range of estimates of fishing mortality (F), however, and advised that fishing mortality rates need to be reduced 20-40 percent to reach proposed fishing mortality rate threshold (Fmax, the rate of fishing that maximizes yield per recruit), and that discards should be reduced. The SAW recommended that the proxy fishing mortality reference points in the FMP be changed to one based on yield-per-recruit analysis, such as Fmax.

2.5.2 Court Decisions directly or indirectly affecting this FMP

2.5.2.1 Trip limit differential lawsuit (*Hall v. Evans*)

In 2001, a Rhode Island Federal Magistrate Judge issued recommendations to the Federal District Court Judge on motions for summary judgment in a suit brought by several southern New England and New Jersey gillnetters challenging the differential trip limits in the FMP for vessels fishing under a monkfish DAS (*Hall v. Evans,* C.A. No. 99-549L). The Federal District Court Judge agreed with most of the conclusions and opinions of the Magistrate Judge and ruled that based on the justification provided in the FMP, the differential trip limit violated National Standards Two, Four and Five of the Magnuson-Stevens Act. The judge vacated the 300 pound-per-day gillnet trip limit and set a 1,500 pound trip limit "for all monk fishermen…until such time as the Secretary [of Commerce] establishes a fair and equitable gear differential or otherwise revises the catch limit". The judge later clarified the order that the trip limits apply by permit category. The effect of this order was that the trip limit on non-trawl (i.e. gillnet) vessels was raised from 300 lbs./DAS to 1,000 or 1,500 lbs./DAS, depending on permit category, the trip limits in effect for FY2001. In general, this court order has resulted in trip limits for the SFMA that are equivalent across gear types.

2.5.2.2 EFH lawsuit (*AOC v. Daley*)

Pursuant to the Magnuson-Stevens Act and the EFH regulations, the Councils submitted FMP amendments and associated Environmental Assessments (EAs), as required under the National Environmental Policy Act (NEPA), to NMFS for Secretarial review. NMFS approved or partially approved all the EFH fishery management plan amendments in accordance with section 304(a) of the Magnuson-Stevens Act. Subsequently, a coalition of seven environmental groups and two fishermen's associations filed a lawsuit challenging NMFS' approval of certain EFH amendments prepared by the Gulf of Mexico, Caribbean, New England, North Pacific, and Pacific Fishery Management Councils (*American Oceans Campaign et. al. v. Daley et al.*, C.A. No. 99-982(GK)). The suit specifically contested the adequacy of the evaluations of fishing gear impacts on EFH in the fishery management plan amendments, and the analyses of environmental impacts in the EAs.

The U.S. District Court for the District of Columbia found that the agency's decisions on the subject EFH amendments were in accordance with the Magnuson-Stevens Act, but found that the EAs for the Councils' amendments were inadequate and in violation of NEPA. The court determined that the EAs prepared for the EFH provisions of the fishery management plans did not fully consider all relevant alternatives. The court specifically criticized several of the EAs for evaluating only two options for the EFH amendments: either approval of the amendment or status quo. Additionally, the decision noted that the descriptions and analyses of the environmental impacts of the proposed actions and alternatives were vague or not fully explained. The court ordered NMFS to complete a new and thorough NEPA analysis for each EFH amendment named in the suit. This Environmental Impact Statement (EIS) responds, in part, to the court's directive to NMFS to complete new NEPA analyses for the Monkfish FMP. Although the plaintiffs' complaint focused on whether NMFS had adequately evaluated the effects of fishing on EFH, NMFS decided to complete new EISs to evaluate all of the EFH components of the applicable fishery management plans. Accordingly, this EIS reevaluates the impacts of amending the Monkfish FMP to include the EFH provisions required by the Magnuson-Stevens Act.

2.5.2.3 Multispecies Framework 33 lawsuit (*CLF v. Evans*)

In December 2001, the Conservation Law Foundation and other organizations successfully filed suit against NMFS alleging that the rebuilding plans the NMFS implemented were not consistent with the Multispecies Amendment 9 overfishing definitions (*Conservation Law Foundation, et al. v. Evans, et al.*). Additionally, they charged that there had been a consistent failure in management plans to assess bycatch reporting and establish measures to minimize bycatch and bycatch mortality (when bycatch is unavoidable). After a long series of negotiations among various parties, the court adopted interim measures and instructed NMFS to submit a management plan to comply with the law. In response, the NEFMC has developed Multispecies Amendment 13 to address stock rebuilding issues, greatly reduce fishing effort and capacity in the multispecies fishery, and implement additional measures to specifically address habitat protection. Since most of the monkfish permit holders also hold multispecies limited access permits, the measures adopted through Amendment 13 will affect the monkfish fishery managed under this FMP.

2.6 Framework Adjustment 1/Emergency Interim Rule

The regulations implementing the FMP required the Councils to conduct a review of the status of the fishery during Year 3 of the rebuilding plan, FY2001, and make adjustments, as needed, to insure that rebuilding to stock biomass targets by 2009 remain on schedule. Based on the Year 3 review and the results of a new stock assessment (SAW 34, January 2002), the Councils determined that additional work was necessary to thoroughly evaluate stock status, biological reference points and the rebuilding program. To that end, submitted Framework 1, delaying for one year the default measures while the Councils prepared Amendment 2. In Framework 1, the Councils concluded that, based on the best available scientific information, fishing mortality rates had been reduced sufficiently to end overfishing under the fishing mortality threshold reference point recommended by the Stock Assessment Review Committee (SARC 34), and observed that stock biomass was stable (in the SFMA) or increasing (in the NFMA).

NMFS disapproved Framework 1 because it did not comply with the fishing mortality rate threshold specified in the original plan (which had been invalidated by SAW 31 and SAW 34), but implemented a revision to the overfishing definition based on the recommendations of SAW 34 through an emergency interim rule (67 *Federal Register* 35928, May 22, 2002). NMFS also implemented in the emergency rule the management measures recommended by the Councils in Framework 1. In so doing, NMFS concurred with the Councils' determination that the measures in Framework 1 would end overfishing in 2002, based on the revised fishing mortality threshold recommended by SARC 34. The measures in Framework 1/emergency rule also include a revision to the trip limit to account for a federal court decision in vacating the gear-based trip limit differential in the original plan. NMFS extended the emergency interim rule through April 30, 2003 (67 FR 67568, Nov. 6, 2002) to allow the Councils time to complete

Amendment 2. Upon expiration of the emergency interim rule, the default measures in the original FMP would take effect on May 1, 2003 unless the Councils implemented alternative rules, either through Amendment 2 or another framework adjustment.

2.7 Framework Adjustment 2

In June 2002, NMFS informed the Councils that even if they met the November 2002 submission target for Amendment 2, the agency could not guarantee that the measures would be implemented by the start of FY2003. As a result, and to forestall the default measures taking effect, the Councils agreed to put aside work on Amendment 2 and focus on Framework 2, to put in place management measures appropriate to the rebuilding plan and updated scientific information on stock status.

The Councils submitted Framework 2 in January 2003, and the rule became effective on May 1, the start of FY2003 (68 *Federal Register* 22325, April 28, 2003). The framework modified the overfishing definition reference points as recommended by SAW 34, and established an index- and landings-based method for setting annual harvest targets (TACs) to achieve optimum yield and biomass rebuilding goals. Framework 2 also eliminated the default measures established in the original FMP.

Framework 2 implemented a target TAC setting method that is based on the relationship between the 3-year running average of the NMFS fall trawl survey biomass index and annual biomass index targets that are based on 10 equal increments between the 1999 biomass index (at the start of the rebuilding program) and the biomass target reference point (B_{target}). According to this method, annual target TACs are set based on the ratio of the observed biomass index to the annual index target applied to the monkfish landings for the previous year. If the observed index is above the annual target, the TACs will be increased proportionally above the previous year's landings, to a maximum of 20 percent. If the observed index is below the annual target, the TACs is set by applying the ratio of observed/target indices to the previous year's landings. In all cases, the TACs will not be set at a level that exceeds the catch corresponding to F=0.2 ($F_{threshold}$).

Framework 2 also implemented a procedure for calculating trip limits and DAS allocations, once the annual target TACs are determined. In this procedure, the incidental catch of monkfish (on vessels not on a monkfish DAS) is subtracted from the target TAC. The remaining portion of the target TAC is distributed formulaically to the directed fishery based on observed effort and catch rates in the previous year. If the TAC is less than 8,000 metric tons, which would result in trip limits less than 550 lbs. and 450 lbs. (tail wt. per DAS, for Category A&C, and B&D, respectively), then trip limits are kept at that level, and DAS are reduced. This was the case in FY2004, when vessels were only allowed to use 28 DAS in the Southern Area.

2.8 Take Reduction Plans and Other Actions to Minimize Interactions with Protected Species

2.8.1 Harbor Porpoise TRP

NMFS published the rule implementing the Harbor Porpoise Take Reduction Plan (HPTRP) on December 1, 1998. The HPTRP includes measures for gear modifications and area closures, based on area, time of year, and gillnet mesh size. In general, the Gulf of Maine component of the HPTRP includes time and area closures, some of which are complete closures; others are closures to gillnet fishing unless pingers (acoustic deterrent devices) are used in the prescribed manner. The Mid-Atlantic component includes time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Under the HPTRP, monkfish gillnets are required to comply with the requirements for large-mesh gillnets (defined as 7-18 inch mesh under the HPTRP). These include mandatory use of tie-downs and a net cap of 80 nets. The net cap is particularly relevant since the current FMP for monkfish has a net cap of 160 nets. Fishermen are required to comply with the most restrictive of all measures that apply to them. Therefore, monkfish gillnetters fishing in the Mid-Atlantic (as defined under the HPTRP) can only fish up to 80 nets (nets may be up to 300' long).

2.8.2 Atlantic Large Whale Take Reduction Plan (ALWTRP)

The ALWTRP contains a series of regulatory measures designed to reduce the likelihood of fishing gear entanglements of right, humpback, fin, and minke whales in the North Atlantic. The main tools of the plan include a combination of broad gear modifications and time/area closures (which are being supplemented by progressive gear research), expanded disentanglement efforts, extensive outreach efforts in key areas, and an expanded right whale surveillance program to supplement the Mandatory Ship Reporting System.

Key regulatory changes implemented in 2002 included: 1) new gear modifications; 2) implementation of a Dynamic Area Management system (DAM) of short-term closures to protect unexpected concentrations of right whales in the Gulf of Maine; and 3) establishment of a Seasonal Area Management system (SAM) of additional gear modifications to protect known seasonal concentrations of right whales in the southern Gulf of Maine and Georges Bank.

The most recent change to the ALWTRP, which became effective on September 25, 2003, allows lobster trap and anchored gillnet gear in a DAM zone once a closure is triggered, but specifies additional gear modifications designed to reduce the risk of entanglements of Northern right whales. A DAM zone may be identified and a closure triggered within defined areas north of 40° N. latitude.

2.8.3 NMFS Rule to Conserve Sea Turtles

NMFS published a final rule (67 *FR* 71895, December 3, 2002), effective January 2, 2003, that enacted a series of seasonal closures to the use of large mesh gillnets in the EEZ off the coast of Virginia and North Carolina. The purpose of the closures is to reduce the impact of the monkfish fishery on endangered and threatened species of sea turtles. This final rule followed several temporary actions taken by NMFS since 2000 in response to sea turtle strandings.

Federal waters between Oregon Inlet and the North Carolina/South Carolina border are closed year round, while three other areas to the north (up to Chincoteague, VA) are closed from March 16, April 1, and April 16, respectively, to January 14 each year.

2.9 Other Regulatory Actions affecting the Fishery

The majority of vessels fishing for monkfish, either as an incidental catch or a directed fishery, are also involved in a number of other fisheries in the region where regulatory action may directly or indirectly affect their operations. This section briefly summarizes actions undertaken or under consideration in three of those fisheries, Northeast Multispecies Sea Scallops and Skates.

2.9.1 Multispecies FMP Amendment 13

The Council developed Amendment 13 to the Multispecies FMP to bring the FMP into conformance with all Magnuson-Stevens Act requirements, including ending overfishing and rebuilding all overfished groundfish stocks. Amendment 13 was partially approved by the Secretary of Commerce on March 18, 2004. A final rule implementing the amendment was published April 27, 2004 (69 *Federal Register* 22906) and become effective May 1, 2004. Amendment 13 adopted a suite of management measures to reduce fishing mortality on stocks that are either overfished, or where overfishing is occurring, and other management issues as summarized below:

- **Measures to achieve stock rebuilding**: measures designed to comply with Magnuson-Stevens Act requirements to rebuild overfished fisheries, and end overfishing where it is occurring. This includes management measures such as DAS reductions, gear restrictions, trip limits areas closures, TACs and other measures. It also includes measures that will affect the recreational fishery.
- **Measures to reduce capacity**: measures developed by the Council to control fishing capacity and potentially remove excess effort from the fishery.
- **Fishery program administration**: measures to address issues that are primarily administrative in nature, though some may have biological, social, or economic impacts. This section includes the DAS leasing alternatives.
- **Measures that minimize, to the extent practicable, adverse effects of fishing on habitat**
- **Other issues**: measures developed to alter restrictions on two exempted fisheries and one exempted gear.

For several groundfish stocks, the mortality targets adopted by Amendment 13 represented substantial reductions from existing levels. For other stocks, the targets were at or higher than existing levels and mortality could remain the same or even increase. Because most fishing trips in this fishery catch a wide range of species, it is impossible to design measures that will selectively change mortality for individual species. As a result, the management measures adopted by the amendment to reduce mortality where necessary are also expected to reduce fishing mortality unnecessarily on other, healthy stocks. As a result of these lower fishing mortality rates, yield from healthy stocks is sacrificed and the management plan may not provide optimum yield - the amount of fish that will provide the greatest overall benefit to the nation.

In order to increase the fishing effort on and yield from healthy stocks, Amendment 13 created a structure that allows for the development of programs to target healthy stocks. The amendment also included four specific programs, but only two were approved and implemented on May 1, 2004. Consequently, the NEFMC initiated Framework 40A to the Multispecies FMP (see below). The primary purpose of FW 40A is to adopt programs that will provide additional opportunities to target healthy stocks in order to achieve optimum yield. These programs will also mitigate the economic and social impacts caused by the effort reductions adopted by Amendment 13.

Since approximately half of the monkfish permit holders also hold multispecies limited access permits, the measures adopted in Amendment 13 and Framework 40A could have a impact vessels engaged in the monkfish fishery, and on the monkfish resource (see Section 6.6.6.2).

2.9.2 Multispecies Framework 40A

The NEFMC developed Framework Adjustment 40A to the Multispecies FMP to address issues raised with the effort management, DAS, program implemented in Amendment 13. NMFS published a proposed rule for Framework 40A on September 14, 2004 (69 *Federal Register* 55389) with a comment period ending September 29.

One of the primary management measures used by Amendment 13 to control fishing mortality are DAS, which limit the time that vessels with limited access permits can fish for regulated groundfish. Amendment 13 categorized the DAS allocated to each permit as Category A, B (regular), B (reserve) or C DAS. Category A DAS can be used to target any regulated groundfish stocks, while Category B DAS are to be used only to target healthy groundfish stocks. Category C DAS cannot be used until some time in the future. The regulations implementing Amendment 13 only created one opportunity to use Category B DAS: a special access program designed to target Georges Bank yellowtail flounder in Closed Area II.

FW 40A creates additional opportunities to use Category B DAS, including Special Access Programs (SAPs), and a one-year Pilot Program for using B Regular DAS outside of the SAPs. This latter program is the one that potentially has an impact on the monkfish fishery because if the pilot program is successful, it will be a model for a future B Regular DAS management program. Under this program, multispecies vessels can target monkfish and healthy groundfish stocks, provided the quarterly TACs for the stocks of concern are not caught. Even though the total number of DAS on which multispecies vessels could target monkfish is less under this program, overall monkfish effort could increase under this program since vessels that did not direct on monkfish in past years could choose now choose to do so, since it is one of only a few stocks that would be available for targeting under a B DAS.

2.9.3 Atlantic Sea Scallop FMP Amendment 10 and Emergency Action

On November 11, 2003, the NEFMC submitted a final Amendment 10 document to the Atlantic Sea Scallop FMP (including a Final SEIS), and re-submitted a revised version on December 19. The proposed rule (69 *Federal Register* 8915, February 26, 2004) comment period ended on March 29, 2004. Since the fishing year under this FMP starts on March 1, measures adopted in Amendment 10 could not be in place at the start of the fishing year, so NMFS implemented regulations under the emergency action authority of the Magnuson-Stevens Act to protect against localized overfishing of the Hudson Canyon are during the period before the Amendment 10 rules would be effective (69 *Federal*

Register 9970, March 3, 2004). NMFS published the Amendment 10 final rule on June 23, 2004 (69 *Federal Register* 35194).

Amendment 10 includes a comprehensive, long-term program to manage the sea scallop fishery through an area rotation management program to maximize scallop yield. The program includes a flexible boundary, adaptive area rotation system, beginning with a new closure off the Maryland coast. The rotation plan also continues the controlled access program for the Hudson Canyon Area and initiates mechanical rotation in parts of the Georges Bank closed areas, although access to the Georges Bank areas. This latter provision required approval of a groundfish framework adjustment to address groundfish bycatch concerns (see Scallop Framework 16/Multispecies Framework 39, below). Other features of the area rotation system include an expanded at-sea observer program and scallop-related research, both of which would be funded by scallop set-aside programs.

In addition to the rotational management program, Amendment 10 implemented an increase in twine top mesh from 8 to 10-inches and an increase in minimum dredge ring size from 3½ inches to 4-inches diameter. These changes will reduce bycatch and improve dredge efficiency while increasing the catch of larger sea scallops. It is expected that the larger ring will reduce bottom contact time per day and potentially reduce adverse effects on essential fish habitat. Amendment 10 also adopts a habitat closure, using portions of the groundfish closed areas, that would apply to vessels fishing with scallop gear until subsequent action is taken to replace or modify these areas. The Amendment also updated DAS allocations and allocated area-specific DAS and trip limits in controlled-access areas.

2.9.4 Scallop Framework 16/Multispecies Framework 39

The NEFMC developed Framework Adjustment 16/39, to the Scallop and Multispecies FMP, respectively, to address and implement scallop area management in parts of the groundfish closed areas. NMFS published a proposed rule for Framework 16/39 on August 26, 2004 (69 *Federal Register* 52470) and a final rule on November 2 (*69 FR 63460).*

Scallop biomass in portions of these areas has increased to high levels as a result of the closure to scallop fishing since 1994 to achieve groundfish mortality and rebuilding objectives. Although the Council wanted to allow controlled scallop fishing access starting with the 2004 fishing year, the specific issues associated with scallop fishing in the groundfish mortality closed areas were too complex and controversial to incorporate into Scallop FMP Amendment 10. Instead, Framework Adjustment 16/39 focuses on these issues, considering and analyzing the potential effects of alternatives to achieve the Scallop FMP goals with area rotation, without causing unacceptable impacts for groundfish habitat and bycatch.

Alternatives associated with Framework Adjustment 16 focus on allocations of fishing effort and scallop TACs, provisions to fund observers and research, enforcement provisions, and monitoring requirements. Alternatives associated with Framework Adjustment 39 focus on measures to minimize or control bycatch, including when and where scallop fishing may occur, as well as a limit on how much bycatch would be allowed. The joint framework also revises the EFH closures implemented in Amendment

10 (Scallops) to make them consistent with those implemented in Amendment 13 (Multispecies).

As noted in the Framework 16/39 submission document, scallop dredges often catch monkfish targeting sea scallops in many areas, and monkfish have been a significant part of the vessel's revenue at various times over the last 15 years. In fact, when scallop catches and revenue were low, many limited access scallop vessels have a history of targeting monkfish with scallop dredges. Because of this and the low survivability of monkfish after discarding, the Monkfish FMP allocates fairly generous trip limits for vessels on a scallop DAS, 300 lbs. tail-weight per DAS. In addition, some scallop vessels qualify for a limited access monkfish permit that allows them to catch and land more than this limit for 40 DAS to be counted against the limited access scallop DAS allocation.

Monkfish appear to be nearly as abundant within the access areas as they are elsewhere, based on the estimated bycatch in the 2000 access program. No targeting of monkfish was observed and targeting monkfish with a controlled access DAS is very unlikely due to the high catches of more-valuable scallops. With the proposed action and alternative rotation schedule, the daily catch rate is expected to vary between 175 to 332 lbs./day during 2004-2007. These are estimates of annual average catches per DAS, so conditions and catches will vary on individual trips made at various times of the year. Nonetheless, increases in discarding of monkfish are not expected because the catches are not substantially greater than the daily monkfish possession limit that applies on a limited access scallop DAS. Monkfish catches may decline overall, however, due to reductions in total fishing time that are anticipated under the access programs.

2.9.5 Skate FMP

On August 19, 2003, NMFS published regulations implementing the Skate FMP submitted by the NEFMC (68 *Federal Register* 46963). The purpose of the FMP is to implement permanent management measures for the northeast skate fisheries to prevent overfishing of skate resource. These regulations include the following measures: A possession limit for skate wings; a bait-only exemption to the wing possession limit restrictions; a procedure for the development, revision, and/or review of management measures on an annual, biennial, and inter-annual basis, including a framework adjustment process; open access permitting requirements for fishing vessels, operators, and dealers; new species-level reporting requirements for skate vessels and dealers; new discard reporting requirements for Federal vessels; and prohibitions on possessing smooth skates in the Gulf of Maine (GOM) Regulated Mesh Area (RMA), and thorny skates and barndoor skates throughout the management unit.

The Skate FMP identified and characterized a baseline of seven management measures in other fisheries that provide additional conservation benefits to skate species. If the Council initiates an action in another FMP that changes one of the seven baseline measures such that the change is likely to have an effect on the overall mortality for a species of skate in a formal rebuilding program, then the Skate FMP requires a baseline review. Of the seven skate species managed under the Northeast Skate Complex FMP, only two species are in a formal rebuilding program: thorny and barndoor.

Monkfish DAS restrictions for monkfish only permit holders, Multispecies DAS restrictions and Scallop DAS restrictions are three of the seven baseline management measures identified in the Skate FMP that reduce impacts on skate mortality. Since the Councils considered in this amendment measures that would decouple Monkfish and Multispecies/ Scallop DAS, resulting in a potential increase in overall effort levels, the Skate PDT is required to evaluate the potential impacts of this change on the overall mortality of thorny and barndoor skate. All other measures proposed in Amendment 2 do not change any of the baseline measures identified in the Skate FMP, thus the skate baseline review is only triggered by the alternative to decouple Monkfish and Multispecies/Scallop DAS. Since the Councils rejected the proposal to decouple DAS usage requirements, the Skate Baseline Review appears under the section discussing impacts of non-preferred alternatives (Section 6.2.2.2).

2.10 Notice of Intent and Scoping

The Councils published a Notice of Intent to prepare an SEIS and formally initiate scoping on this amendment on December 10, 2001 (66 *FR* 63666). See Section 8.1.2 for information regarding the scoping process for this amendment, including scoping on the EFH components.

2.11 Summary of Current FMP Regulations

The following tables summarize the regulations in effect under the current FMP through Framework 2.

FMP Element	NFMA	SFMA
Target TAC	Calculated annually based on two factors: 1) three year running average fall survey biomass index compared to annual biomass rebuilding target 2) previous year landings If F is known, TAC is set to not exceed F threshold.	Same as NFMA
DAS	40	40, or lower if trip limit is calculated to be less than 550/450 lbs. tails/DAS on Cat. A, C & B,D, respectively. For FY2004, vessels will have 28 DAS to fish in the SFMA.
Liver landings	Maximum of 25% of wt. of tails or 10% of wt. of whole MF	Same as NFMA
Minimum fish size	11" tail, 17" whole	14" tail, 21" whole
Minimum mesh size on MF DAS	Trawl: 10" sq/12" dia. codend; Gillnet: 10"	Same as NFMA
Area Declaration	Must declare into NFMA for minimum of 30 days to fish under less restrictive measures (trip limits, minimum fish size); to be adjusted to 7 days by technical amendment	
Exempted Fishery	Must fish on a Multispecies or Scallop DAS or in an Exempted Fishery (gillnet only)	Must fish on a Multispecies or Scallop DAS or in an Exempted Fishery
Trip limits and Incidental Catch limits see table below.		

Table 6 Summary of current FMP regulations

Permit Category	DAS Program	Area	Gear[1]	Trip/Incidental Catch Limit [2] (tail weight per DAS)
A, B, C, or D	Monkfish	NFMA	All Gear	No trip limit
A or C	Monkfish	SFMA	All Gear	550 lb (FY2004, adjusted annually)
B or D	Monkfish	SFMA	All Gear	450 lb (FY2004, adjusted annually)
C or D	Multispecies	NFMA	All Gear	No trip limit
C or D	Multispecies	SFMA	Trawl	300 lb
C or D	Multispecies	SFMA	Non-trawl	50 lb
C or D	Scallop	NFMA & SFMA	Dredge or net exemption	300 lb
E (incidental)	Multispecies	NFMA	All Gear	400 lb, or 50% of total weight of fish on board, whichever is less
E (incidental)	Multispecies	SFMA	All Gear	50 lb
E (incidental)	Scallop	NFMA & SFMA	Dredge	300 lb
A, B, C, D, or E	No DAS	NFMA & SFMA	Large Mesh[3]	Up to 5% of total weight of fish on board per trip[4]
A, B, C, D, or E	No DAS	NFMA & SFMA	Small Mesh[5] or Handgear	50 lb of tail weight per trip
C, D, or E vessels that are <30 feet with a multispecies limited access permit	No DAS	NFMA & SFMA	All Gear	50 lb of tail weight per trip

[1]Dredge gear is prohibited unless fishing under a Scallop DAS
[2] Or the whole-weight equivalent (tail weight x 3.32)
[3]Greater than or equal to the minimum NE multispecies mesh size for the Gulf of Maine, Georges Bank and Southern New England Regulated Mesh Areas, and minimum summer flounder mesh size for the Mid-Atlantic Regulated Mesh Area
[4]Can land whole monkfish or monkfish tails, but the weight of all monkfish on board is converted to tail weight.
[5]Less than the regulated mesh size as specified under footnote 3.

Table 7 Summary of current monkfish trip limits and incidental catch limits

2.12 Purpose and Need

The purpose of the amendment is to achieve the goals and objectives outlined in Section 3.2 below. The need for this action includes problems and issues that have arisen since, or as a result of the FMP implementation, as discussed below; court decisions and orders on elements of the plan as outlined in Section 2.5.2, particularly EFH (*AOC v. Daley*); actions taken in other fisheries that affect the monkfish fishery, as detailed in Section 2.9; and federal guidelines on the periodic updating of environmental documents and the content of fishery management plans, in particular the Council on Environmental Quality's "Forty Most Asked Questions Concerning CEQ's NEPA Regulations" (question 32).

This SEIS responds, in part, to the court's directive in the EFH lawsuit (*AOC v. Daley*) that NMFS complete new NEPA analyses for the Monkfish Fishery Management Plan. This amendment will minimize, to the extent practicable, the adverse effects of fishing on essential fish habitat to comply with section 303(a)(7) of the Magnuson-Stevens Act. More specifically, one purpose of the amendment is to identify and describe adverse effects of fishing on EFH and to minimize to the extent practicable these adverse effects. Although the plaintiffs' complaint focused on whether NMFS had adequately evaluated the effects of fishing on EFH, NMFS decided to complete new EIS's to evaluate all of the EFH components of the applicable fishery management plans. Accordingly, this SEIS reevaluates the impacts of amending the Monkfish FMP to include the EFH provisions required by the Magnuson-Stevens Act.

As noted, in addition to the issues raised in the lawsuits discussed above and in Section 2.5.2, the implementation of the FMP created several circumstances and situations which members of the public identified prior to and during the scoping process as problematic or unfair. In particular, the Councils received the following comments (summarized or paraphrased):

- During the course of development of the Monkfish FMP, a fishery for monkfish developed south of the border separating Virginia and North Carolina. A small number of North Carolina and Virginia vessels began participating in this fishery shortly after publication of the monkfish limited access permit control date (February 27, 1995). The monkfish season in this area runs from mid-March to June. These southern vessels did not possess other federal northeast fishery permits and, therefore, did not receive timely notices and other information about limited access proposals contained in the Monkfish FMP. In addition, the southern boundary of the fishery management unit initially proposed for monkfish was the border separating Virginia and North Carolina. Although this southern boundary was twice modified (the final boundary was extended southward to the North Carolina and South Carolina border) before public hearings, the Monkfish FMP public hearing document described the management unit, and hence the limited access proposal, as terminating at the Virginia and North Carolina border, not south of that line where much of the affected fishery takes place.
- NMFS disapproved the "running clock" provision that would have enabled vessels to exceed their per-day trip limit and then run out the

commensurate DAS time while at the dock. This action, in combination with the requirement for Category C and D vessels to use a multispecies or scallop DAS when on a monkfish DAS, made offshore monkfish trawl trips unprofitable, especially in years when the trip limit was set relatively low. Members of the industry appealed to the Councils to restore the offshore fishery to a level of profitability within the requirements of the rebuilding program.

- Several individuals commented that the minimum fish size was contributing to discards, particularly on trips where vessels were using multispecies regulated mesh, rather than the larger mesh required on monkfish (but not multispecies) DAS
- Industry members requested the Council to implement the same exemptions for fishing outside the EEZ that already exist in the Multispecies FMP, so that vessels could investigate and promulgate a fishery in the NAFO Regulated Area.
- When the FMP was first implemented, numerous members of the affected public commented that the plan was extremely complicated and difficult to understand. Over the course of the next couple of years, however, the same individuals commented that the plan was more understandable than initially thought and that compliance at the vessel level was not so difficult once the operator learned the specific regulations that applied to his/her situation.

In April 2002, one conservation organization submitted comments on proposed Framework 1 expressing its concerns and issues with the Monkfish FMP. In responding to comments on the Emergency Interim rule, NMFS noted that those issues would be addressed in Amendment 2 which at that time was under development. In April 2003, as the Councils were finalizing the range of alternatives to be considered in the DSEIS, the organization re-submitted those comments and asked that they be addressed in Amendment 2. Those comments focused on three areas: improving data collection and research, especially in regards to bycatch; minimizing bycatch in the directed and incidental catch fisheries; and minimizing impacts of the monkfish fishery on designated EFH. The Councils note that these issues have been identified in the goals and objectives and form the basis for many of the alternatives considered.

2.13 Amendment 2 Public Comment Period and Hearings

NMFS published a Notice of Public Hearings and Request for Comments on May 28, 2004 (69 *Federal Register* 30624, May 28, 2004), announcing a 90-day comment period. The Councils held six public hearings, as follows:

DATE	LOCATION
June 15	Wading River, NY
June 16	Toms River, NJ
June 17	Manteo, NC
June 22	Fairhaven, MA
June 23	Peabody, MA
June 24	Portland, ME

Appendix III contains the hearing summaries and written comments, including a table summarizing the written comments received during the comment period, as well as late comments. Appendix III also has a summary of the comments and the Councils' response.

3.0 GOALS AND OBJECTIVES

3.1 FMP Goals

The Councils adopted four management goals in the original FMP. These are:

1. To end and prevent overfishing; rebuilding and maintaining a healthy spawning stock.
2. To optimize yield and maximize economic benefits to the various fishing sectors.
3. To prevent increased fishing on immature fish.
4. To allow the traditional incidental catch of monkfish to occur.

These four goals were intended to ensure adequate spawning and the highest possible yields without radically altering the fisheries for other species, or causing extensive regulatory discards. In addition, they addressed the problem of the intensified fishing effort directed on small monkfish that occurred during the 1990's.

3.2 Goals for this Amendment

In addition to complying with the goals of the Magnuson Act, generally, and the Sustainable Fisheries Act (SFA) amendments, specifically, the goals of this amendment are:

I. Prevent overfishing or rebuild overfished stocks as necessary.

II. Address problems created by the implementation of the FMP.

Objectives:

1) Reconsider the limited entry program for the monkfish fishery south of 38° N

2) Address problems for deepwater fisheries resulting from the disapproval of the running clock in the original FMP

3) Address the problem of multispecies or sea scallop permit holders having to use a multispecies or sea scallop day at sea (DAS) when using a monkfish DAS

4) Establish appropriate exemptions for vessels fishing for monkfish outside of the EEZ (in the NAFO Regulated Area)

III. Promote improved data collection and research on monkfish

IV. Comply with CEQ (Council on Environmental Quality) Guidelines to update Environmental Documents

V. Address deficiencies in meeting Magnuson Act requirements

Objectives:

1) Meet Magnuson Act requirements for Essential Fish Habitat

2) Address known bycatch issues, specifically due to trip limits and minimum fish size

VI. Address protected resources/fishery interactions

Objective: specifically address the turtle/gillnet interaction

VII. Reduce FMP complexity where possible.

The following table identifies the alternatives associated with each of the goals and objectives outlined above, and includes reference to the decision document contained in Appendix I.

GOAL	OBJECTIVE	DECISION (Appendix I)
I. Prevent overfishing or rebuild overfished stocks as necessary	N/A	All decisions
II. Address problems created by the implementation of the FMP.	1) Reconsider the limited entry program for the monkfish fishery south of 38°N	Decision 9
	2) Address problems for deepwater fisheries resulting from the disapproval of the running clock in the original FMP	Decisions 1 and 8
	3) Address the problem of multispecies or sea scallop permit holders having to use a MS or scallop DAS when using a MF DAS	Decision 1, 8 and 14
	4) Establish the appropriate exemptions for vessels fishing for monkfish outside of the EEZ	Decision 10
III. Promote improved data collection and research on monkfish.	N/A	Decisions 1, 3, 6, 8, 12, and 14
IV. Comply with CEQ Guidelines to update environmental documents.	N/A	Decisions 1, 3, 4, and 6
V. Address deficiencies in meeting MAGNUSON-STEVENS Act requirements.	1) Meet MAGNUSON-STEVENS Act requirements for EFH	Decisions 11, 12 and 14
	2) Address bycatch issues, specifically due to trip limits and minimum fish size	Decisions 2, 3, 4, 6, 12, 14 and 17
VI. Address protected resources/fishery interactions.	Specifically address the turtle/gillnet interaction	Decisions 12 and 17
VII. Reduce FMP complexity where possible.	N/A	Decisions 6 and 13

Table 8 DSEIS alternatives and their relationship to specific goals and objectives, including reference to decision document in Appendix I.

4.0 PROPOSED ACTION AND ALTERNATIVES

4.1 Proposed action

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.2 that each preferred alternative addresses. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission.

4.1.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries. The proposed alternatives would address current or potential monkfish bycatch issues on vessels engaged in other fisheries. As monkfish stocks rebuild, the potential for incidental catch increases, and the proposed alternatives would enable vessels to land such catch, rather than discarding it, while not appreciably affecting the allowable catch that is available to directed fisheries.

4.1.1.1 Incidental catch – 50 lbs. (tails) per day/150 lbs. maximum

This is Alternative 2, Decision 2 in Appendix I. The incidental catch limit is currently 50 lbs. (tails) per trip on all vessels not on a DAS and fishing with small mesh (defined as mesh smaller than multispecies minimum mesh in the GB/GOM and SNE Regulated Mesh Areas, and fluke minimum mesh, specified in §648.94 (c) (3)(i), in the Mid-Atlantic regulated mesh area) and handgear. The same limit applies on multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used.

Under the proposed action, vessels would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 150 lbs.. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

Discussion/Rationale: This was the Councils' preferred alternative in the DSEIS, and the recommendation of the Monkfish Committee. While most of the industry advisors recommended taking no action out of concerns for the enforceability of this proposal (tracking the number of days of the trip), the Monkfish Committee recommended this alternative because they said it would reduce regulatory discards on multi-day whiting and squid trips in the SFMA. The Committee also noted that a 150 lbs. possession limit would not create an incentive to target monkfish on those trips. Regarding the enforcement concerns, the Committee believed that current electronic trip reporting systems (i.e., VMS) and future electronic vessel logbooks would make this measure more enforceable.

4.1.1.2 Incidental catch -General Category scallop dredge and clam dredge

This is Alternative 2, Decision 3 in Appendix I. The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels. General Category scallop dredge vessels are an open access permit category in which vessels are restricted to a possession limit of 400 pounds of scallop meats. Clam dredge vessels are managed under an Individual Transferable Quota (ITQ) system, and harvest surf clams and ocean quahogs with a hydraulic dredge.

Discussion/Rationale: This was the Councils' preferred alternative in the DSEIS, and the recommendation of the Monkfish Committee. The industry advisors supported allowing these vessels to retain incidentally caught monkfish, but only up to a 50 lbs. possession limit. For the same reasons outlined under the incidental catch limit proposal in Section 4.1.1.1, and recognizing that the General Category Scallop fishery is a day fishery (being restricted to a possession limit of 400 lbs. of scallops), the Committee recommended including these vessels in the same incidental catch category as the small mesh fisheries. Furthermore, the Committee felt that uniform incidental catch limits, to the extent they are consistent with the fishery characteristics and FMP goals, was important for ease of compliance and enforcement.

4.1.1.3 Incidental catch - summer flounder vessels west of 72°30'W

This is Alternative 2, Decision 4 in Appendix I, although as recommended by the Industry Advisory Panel and the Monkfish Committee, the Councils are setting a maximum possession limit for vessels fishing in this category for the reasons discussed below. The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island. This action would restore the area specified in the original FMP where vessels fishing with the minimum mesh size required under the summer flounder (fluke) FMP are considered to be using "large mesh" for the purpose of determining the applicable monkfish incidental catch limit, but it would not change regulations implemented under the groundfish interim rule, other than the monkfish incidental catch limit in the area between 74°00'W and 72°30'W.

Discussion/rationale: Both the Advisory Panel and Monkfish Committee recommended this action, which was the Councils' preferred alternative in the DSEIS but without the maximum possession limit. Based on public comment and the Advisory Panel and Committee discussion, the Councils adopted the 450-lbs. possession limit. The Councils noted that the fluke fishery in that area has a higher incidental monkfish catch than the small-mesh fisheries in the area, and that this action would reduce regulatory discards. The Councils adopted the 450-lbs. possession limit because that is the trip limit that is allowed on directed (DAS) trips in some years, and it would not be equitable, nor reasonable to allow an incidental limit to be higher than the directed limit. The Councils also noted that, perhaps more importantly, the fluke fishery has evolved since this regulation was initially adopted (without the total monkfish possession limit), and that the total landings of all species (primarily scup plus fluke) is now significantly higher than in the past. As a result, basing the incidental limit solely on a percentage of the total, creates the possibility of excessive, or even targeted monkfish catches, beyond what was anticipated when the original FMP was adopted.

4.1.2 Minimum fish size

This is Option 1, Alternative 2, Decision 6 in Appendix I. The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA).

Discussion/Rationale: The Councils considered four alternatives for minimum fish size, including the no action alternative. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch (regulatory discards). Furthermore, a uniform size is more enforceable than having two area-based sizes. Minimum fish size regulations have been widely used in FMPs on the basis that they discourage the targeting of small fish, and increase yield per recruit (if successfully linked to gear requirements that have the appropriate size selectivity characteristics).

The Advisory Panel was evenly divided on supporting this action, or taking no action. The supporters of taking no action did not want the minimum size reduced in the southern area, preferring to increase mesh sizes. The Councils have indicated that their preference for a uniform minimum fish size is based primarily on improving enforcement and reducing regulatory discards. The action will also reduce FMP complexity, consistent with Amendment 2 Goal VII. Furthermore, the Councils' decision to not eliminate the minimum size, as recommended by the PDT, confirms the original basis for the minimum size rule, that is, to discourage targeting of small fish and increasing yield per recruit.

4.1.3 Closed season or time out of the fishery

This is Alternative 2, Decision 7 in Appendix I. The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as multispecies.

Discussion/Rationale: The PDT reviewed the current regulations requiring vessels to take 20-day blocks out of the fishery during the spring and agreed that there is no apparent biological benefit from a 20-day-out requirement. Under the current 20-day block out of a 90 day period, a vessel still has 70 calendar days during which it could use most or all of its 40 monkfish DAS. Scallop/monkfish vessels are not subject to this requirement. As long as other fishing can occur, the benefits to spawning will not be realized, even if they cannot be measured or predicted.

4.1.4 Offshore SFMA Fishery

This is Alternative 2, Decision 8 in Appendix I, with Area Option 1 and DAS/trip limit Option 2. The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England. Currently, vessels fishing offshore are subject to the same DAS, trip limits and gear requirements that apply on the same permit category inshore. This program would establish a separate set of regulations for vessels fishing in the offshore waters of the SFMA. Vessels may elect to enroll in the fishery on an annual basis and be subject to the following program elements. A vessel would not have to be enrolled in the program to fish in the area, in which case it would operate under the regular rules (trip limit, no VMS requirement, and DAS) applicable to that gear and permit.

Program elements:

Vessel Participation: A vessel must declare its intent to participate in the Offshore Monkfish Fishery Program when applying for its annual vessel permit, and NMFS will issue a Category F permit. Note that in the DSEIS this program was proposed as being administered through issuance of a Letter of Authorization, but in drafting proposed regulations, the staff determined that program administration would better administered by issuance of an annual permit to be consistent with programs in other fisheries that impact annual DAS allocations, such as the small dredge scallop fishery program and the large mesh multispecies program.

Area: (Offshore Area Option 1)- The area proposed is offshore of the loligo squid exemption line (approximately 50 fathoms) and north of 38°00'N, (Figure 2). Vessels would be subject to any gear-based closed area restrictions that might apply under this or other FMPs. Such restrictions could include areas closed to protect EFH as discussed in Section 4.1.8.

Season: October 1 –April 30

Trip limits/DAS - Directed fishery: (Offshore program DAS/trip limits Option 2): Under the proposed action, all vessels enrolled in the offshore fishery program would have a trip limit of 1,600 lbs./DAS (tail weight), and a variable DAS allocation that would be calculated at the time of enrollment in the program. The DAS allocation would be calculated as the product of applying a trip limit ratio (the standard permit category trip limit applicable to non-participating vessels in the SFMA divided by 1,600 lbs) times the DAS available to vessels fishing in the SFMA. Unless otherwise set by the annual adjustment procedure, the DAS allocated to each vessel is 40 (less any portion set aside for cooperative research under the proposal in Section 4.1.9), but in some years (such as 2004) the DAS allocation could be less, depending on the progress of the rebuilding program.

Incidental catch limits (not on DAS): The same incidental monkfish catch limit applies to the vessel as other similar vessels when not on a DAS (gear- , area- , and permit category-based limits). Enrolled vessels fishing on a multispecies DAS in the NFMA would be limited to the monkfish incidental limits applicable to Category E vessels. (Non-enrolled Category C and D vessels on a Multispecies DAS in the NFMA do not have a monkfish trip limit).

Gear: Vessels would be required to use the same gear as Category A and B vessels (monkfish only permits) when fishing on a monkfish DAS, including minimum mesh size applicable on monkfish-only DAS and the roller gear restriction (trawl vessels) proposed in Section 4.1.8, even though Category C and D vessels with multispecies limited access permits would be using a multispecies DAS in conjunction with their monkfish DAS as required under the regulations at §648.9992 (b)(2).

Vessel monitoring system (VMS): Vessels would be required to have a VMS in operation during the entire season (Oct. 1 – Apr. 30). Vessels that are otherwise not required to have a VMS in operation during the entire fishing year, would able to shut down the VMS between May 1 and Sept. 30 in any year in which they enroll in the offshore fishery.

Discussion/Rationale: This proposal addresses the problem created by implementation of the FMP without the "running clock". The Councils' original FMP proposal, disapproved by NMFS, would have allowed vessels to run their DAS clock upon returning to port to account for any trip limit overages. Without the running clock, offshore vessel owners have stated they can no longer profitably fish for monkfish under the restrictive trip limits while also consuming a multispecies DAS. The running clock would have allowed vessels to exceed the per-day trip limit and remain at the dock with the DAS clock running to account for the overage. While the proposed action would establish an enrollment program for vessels wanting to fish in a designated offshore area under a higher trip limit, with other restrictions, other vessels could fish for monkfish in the area under the regular rules applicable to the vessel's permit category and gear. This would preserve maximum flexibility for the fleet, since some vessels may want to fish for monkfish both inside and outside the area, and not have to install a VMS.

The Councils selected the Area Option 1 because it provides access to the offshore monkfish resource on the southern flank of Georges Bank and uses an established management boundary line. The Councils selected DAS/Trip Limit Option 2, based on public comment that vessels would prefer a consistent trip limit from year to year, and also, if any increase in allocation is made, that it be made to DAS rather than increased trip limits.

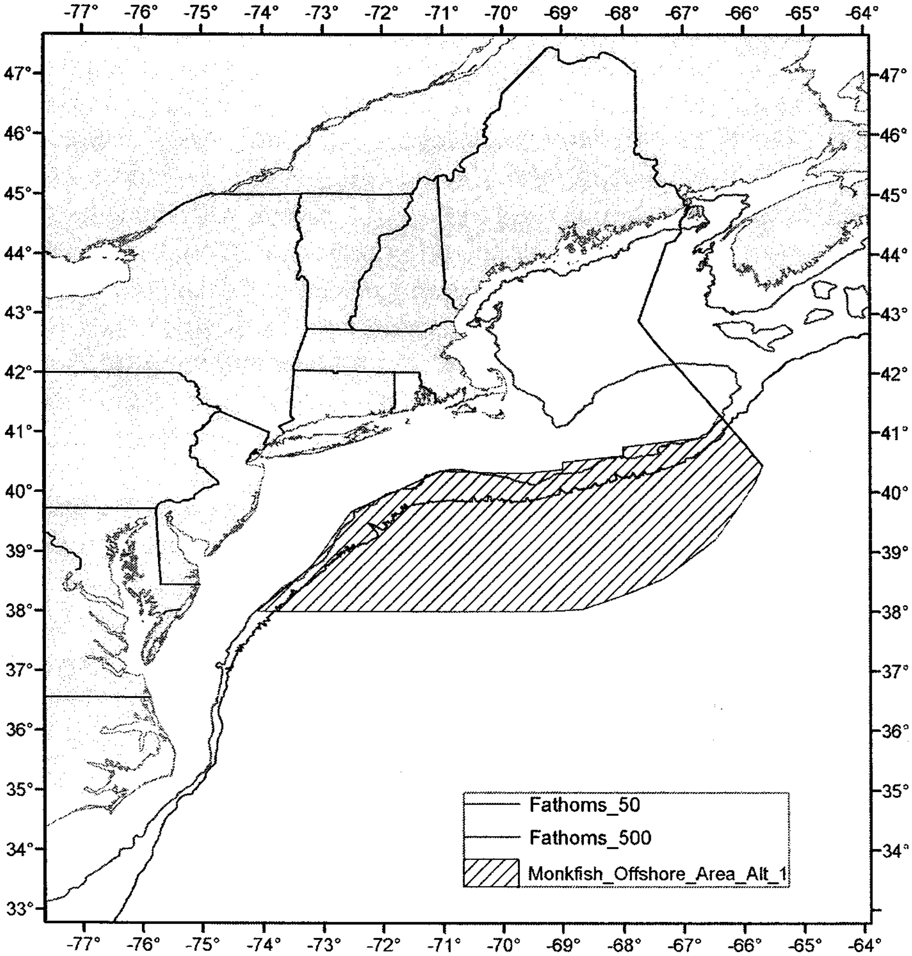


Figure 2 Offshore Area Alternative 1 – based on Illex Exemption Area but terminating at 38°N.

4.1.5 Modification of permit qualification for south of 38°N

This is Alternative 3, Decision 9 in Appendix I. The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described below. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

To qualify for a special limited access permit under this action, a vessel would have to have landed 50,000 lbs. (tail wt.) for a Category A or C permit, or 7,500 lbs. (tail wt.) for a Category B or D permit, in the area south of 38°N, during the March 15 – June 15 period over the four years prior to June 15, 1998. These are the same landings weight qualification criteria as in the original FMP, although the period during which the landings are counted is changed, and the area restriction is applied. The original FMP qualification period was four full years prior to February 27, 1995.

Discussion/Rationale: During the course of development of the Monkfish FMP, a fishery for monkfish developed south of the border separating Virginia and North Carolina. A small number of North Carolina and Virginia vessels began participating in this fishery shortly after publication of the monkfish limited access permit control date (February 27, 1995). The monkfish season in this area runs from mid-March to June. These southern vessels did not possess other federal northeast fishery permits and, therefore, did not receive timely notices and other information about limited access proposals contained in the Monkfish FMP. In addition, the southern boundary of the fishery management unit initially proposed for monkfish was the border separating Virginia and North Carolina. Although this southern boundary was twice modified (the final boundary was extended southward to the North Carolina and South Carolina border) before public hearings, the Monkfish FMP public hearing document described the management unit, and hence the limited access proposal, as terminating at the Virginia and North Carolina border. With the proposed action, the Councils are addressing the concerns of those vessels with a special limited access permit that is based on the characteristics of that southernmost fishery, while not opening up the entire monkfish fishery to new participants.

During the development of alternatives for this proposal, NMFS implemented sea turtle protection measures that closed the primary fishing areas to large-mesh gillnet gear during times when monkfish are present (Section 2.8.3). In response, the Councils proposed to extend the area accessible to vessels qualifying for a monkfish permit under this action from 38°00'N to 38°20'N. This change provides an opportunity for qualifying vessels to target monkfish during the peak season outside the area where sea turtle protection closures are in effect.

4.1.6 Modifications to the framework adjustment procedure

The Councils propose the following additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure.

4.1.6.1 Implement transferable MF-only DAS

This is part of Decision 1c in Appendix I, and is identified as Alternative 1, Option 2b.Under this proposal, the Councils could consider adopting either DAS leasing or DAS sale provisions in a future framework action. Initially, the Councils proposed that this action would only be considered if the Councils adopt Alternative 1, Decision 1, to separate DAS usage requirements on Category C and D permit vessels. Even though the Councils are not proposing such action in this amendment, they decided to include the ability to transfer monkfish DAS in the list of actions that could be taken under the framework adjustment procedure. This would provide greater flexibility to implement such a program in the future, should the Councils decide to consider it. This action would not implement a DAS transfer provision as part of the rule implementing this amendment.

Under this approach, the list of measures that can be adopted under the framework process would be amended to include a program allowing the transfer of monkfish DAS, through leasing or sale between vessels, but would include the stipulation that any such program implemented via the framework adjustment process would have to go through proposed and final rulemaking procedures to maximize the opportunity for public comment.

Discussion/Rationale: The Councils are considering allowing the transfer of monkfish DAS as a way to mitigate the potential cumulative impact of restrictions being considered in scallop and multispecies fisheries that will affect monkfish vessels, and to mitigate the impact of any future monkfish DAS restrictions should they become necessary. The Councils recognize that DAS transfer programs are complicated, still evolving in other FMPs, and potentially highly controversial. For these reasons, the Councils have indicated that even if a DAS transfer program is considered in a future framework adjustment, the proposals would have to go through proposed and final rulemaking, in addition to the appropriate NEPA analysis.

4.1.6.2 Implement measures to minimize fishery impact on protected species

This is part of Decision 17 in Appendix I. The Councils propose to include in the FMP list of actions that can be taken under the framework adjustment process measures to protect sea turtles and other species protected under the Endangered Species Act and/or Marine Mammal Protection Act, as the need arises. The list of measures would include gear-specific seasonal/area closures or gear modification.

Discussion/Rationale: This action will enable the Councils to take timely action to implement measures to address protected species issues that are consistent, to the extent possible, with the other management objectives of the FMP and other applicable laws. The Councils originally considered a second strategy, that is to include in this amendment specific measures to address the immediate problem of sea turtle catches in the large mesh gillnet fishery south of 38°N. The development of specific measures, however, depended on the completion of analysis sea-surface temperature data and other analyses that were not done in time to be included in this amendment. Therefore, no specific measures are proposed for Amendment 2 at this time, other than the proposal outlined above.

4.1.6.3 Implement requirements to use bycatch reduction devices

This is part of Decision 17 in Appendix I. The Councils propose to add "bycatch reduction devices" to the list of measures that can be implemented under the framework adjustment process in the FMP.

Discussion/Rationale: This proposal increases the Councils' flexibility to consider measures to reduce bycatch in a timely manner. The Councils anticipate that such gear-based alternatives may arise out of the cooperative research programs, supported by this amendment, and should be able to be implemented with a minimum of procedural delay.

4.1.7 NAFO Regulated Area exemption program

This is Alternative 1, Decision 10 in Appendix I. Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions, specified in §§648.4, 648.91, 648.92 and §648.94, respectively, while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided:

(a) The vessel operator has a letter of authorization issued by the Regional Administrator on board the vessel;
(b) For the duration of the trip, the vessel fishes, except for transiting purposes, exclusively in the NAFO Regulatory Area and does not harvest fish in, or possess fish harvested in, or from, the EEZ;
(c) When transiting the EEZ, all gear is properly stowed in accordance with one of the applicable methods specified in §648.23(b); and
(d) The vessel operator complies with the High Seas Fishing Compliance permit and all NAFO conservation and enforcement measures while fishing in the NAFO Regulatory Area.

Discussion/Rationale: The proposed action would enable vessels to fish in the NAFO Regulated Area without being subject to the FMP regulations designed to manage the domestic monkfish fishery. The proposed action parallels a similar provision in the Multispecies FMP.

4.1.8 Measures to minimize fishery impact on EFH

The two gear types used in the directed monkfish fishery are bottom trawls and bottom gillnets. Gillnets are not considered to have more than minimal adverse impacts on EFH for any species in the region (See Appendix II), but could damage or remove corals from hard substrates in deepwater canyon habitats (Section 5.4.1.7). Corals are not currently included in the EFH descriptions for any species in the Northeast region; however, deep-sea species of coral are known to grow on hard substrates. Since there are corals found with the proposed closed areas, this is indicative of hard bottom and some coral species are thought to function like other epi-benthic fauna that provide relief and shelter, and are known to be particularily vulnerable to damage or loss by bottom trawld and bottom gillnets (Section 5.1.6 and Section 5.4.1.7). Therefore, the only gear used in the fishery that could have more than a minimal adverse impact on EFH for any species in the region is the bottom trawl. Furthermore, monkfish EFH has been determined not to be adversely impacted in a manner that is more than minimal or more than temporary in nature (See Appendix II). Therefore, the only direct adverse impacts of fishing that need to be minimized in this Amendment are the effects of bottom trawls on the EFH of benthic life stages of 23 other species that have been determined to be more than minimally vulnerable to bottom trawling (see Table 99 in Section 6.3.1.5.3). Damage or loss of deep-sea corals caused by either gear used in this fishery would constitute an indirect adverse impact to EFH in the offshore canyons.

The Councils propose two habitat specific measures to be implemented in this Amendment to address the Magnuson-Stevens Act requirement to minimize, to the extent practicable, the adverse impact of fishing on EFH: EFH Alternative #4, option 3, and EFH Alternative 5AB, option 2. There were several other non-habitat measures considered during the development of Amendment 2 that had beneficial impacts in EFH (EFH Alternative #2); however, none of those measures were selected for the proposed action.

The Councils recognize that there are additional habitat benefits to EFH from measures that were recently approved in Amendment 13 to the Multispecies FMP, as well as Amendment 10 to the Scallop FMP. During the development of this Amendment, these habitat benefits were considered EFH Alternative #3. Since the time alternatives were first developed for Amendment 2, both Amendment 13 and Amendment 10 have been implemented. These habitat benefits were considered separately because during the development of Amendment 2, the Councils were uncertain about when, and if these two Amendments would be approved. Since both Amendment 13 and Amendment 10 are now approved, these EFH benefits are now more appropriately considered part of the No Action alternative (EFH Alternative #1 in this document). Therefore, for NEPA purposes the EFH benefits of these two alternatives are described separately, but the Councils understand that these benefits are actually part of the No Action alternative, since no affirmative action needs to be taken in order to implement these measures. EFH Alternative #3 and the habitat benefits associated with that alternative have been integrated into EFH Alternative #1 (No Action alternative) discussion in Section 4.2.2.9.1, rather than within this Proposed action section.

4.1.8.1 Southern Area trawl disc restriction

This is Option 3, Alternative 4, Decision 11 in Appendix I. The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

Discussion/Rationale: This trawl gear proposal, and another not adopted, were developed during a cooperative workshop held by the Monkfish PDT involving trawl industry members and gear technology experts. Participants agreed that the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. In the southern area the bottom characteristics are more consistent over large areas, while in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud. Under these conditions, southern area vessels can target monkfish successfully with smaller roller gear, and such a restriction would effectively ensure that such vessels do not fish in areas of more complex bottom characteristics, particularly in the offshore canyons.

4.1.8.2 Closure of Oceanographer and Lydonia Canyons to monkfish vessels

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deep-sea canyon habitats. This is EFH Alternative 5AB Option 2, Decision 11 in Appendix I. The closures would take effect when this amendment is implemented, scheduled for May 1, 2005.

Alternative	AREA (nm2)
5 AB	116

Table 9 – Area in square nautical miles of the proposed coral habitat protection areas

	Latitude		Longitude	
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
	40	27	67	38

Table 10 - Coordinates of Habitat Alternative 5AB

Discussion/Rationale:

Since the Councils considered and approved measures to re-establish an offshore directed monkfish trawl fishery in the southern fishery management area, the Councils are proposing closing two deep-sea canyon habitat areas to minimize the potential impacts of that fishery. Within these canyon habitats, a variety of species have been found which are known to provide structured habitat and shelter for some species of demersal fish and invertebrates, including deep-sea corals.

The directed monkfish fishery is conducted with bottom trawls and bottom gillnets, primarily in coastal and offshore waters of the Gulf of Maine, on the northern edge of Georges Bank, and in coastal and continental shelf waters of southern New England, including offshore waters on the edge of the continental shelf, near the heads of several deepwater canyons. Deep-sea corals are known to exist in some of the submarine canyons in the area that is identified for increased offshore fishing. EFH for some federally-managed species extends beyond the edge of the continental shelf and includes portions of some of the canyons. Therefore, the possible expansion of the directed offshore monkfish fishery – either spatially into new areas or in terms of increased fishing intensity in existing areas – increases the probability of adverse impacts to EFH, canyon habitats, and, thus, deep-sea corals. Alternative 5 is intended as a precautionary measure to prevent any potential direct or indirect impacts of an expanded offshore monkfish fishery on EFH and offshore canyon habitats.

The EFH Final Rule states that FMPs must minimize the adverse effects of fishing on EFH, to the extent practicable (600.815(a)(2)(ii)). Adverse effects are defined to mean "any impact that reduces the quality and/or quantity of EFH" and may include "direct, or indirect, physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species, and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH." Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (600.810(a)). The scope of the regulations is rather broad and provides a basis for closed area management alternatives that address the potential indirect habitat or ecosystem impacts of fishing on EFH, as well as the direct impacts on EFH, in offshore canyon habitats. Impacts to offshore canyon habitats, which include deep-water coral species, has a direct adverse impacts on EFH that is more than minimal and less than temporary in nature; therefore, the Councils are considered alternatives to minimize those impacts.

Protection of deep-sea corals is a relatively new concept in this region and the Councils asserted that there are several statutory and regulatory authorities that support the Councils' initiative to protect deep-sea coral habitats, whether or not corals have been specifically identified as EFH for managed species. These authorities include the EFH Final Rule, discretionary provisions of the Magnuson-Steven Act, as well as bycatch provisions of the Magnuson-Stevens Act. National Standard 9 of the Magnuson-Stevens Act requires that management plans minimize bycatch to the extent practicable. NOAA fisheries consider bycatch to include finfish, shellfish, invertebrate species, and all other forms of marine animal and plant life. In the Response to Comments on the National Standard One Guidelines, the specifics of what constitutes as bycatch was examined. Based on the Response to Comment #4, NOAA Fisheries interprets bycatch to include a wide variety of marine species, with or without commercial value. Therefore, there may be regulatory justification to consider alternatives to reduce the impacts of the offshore monkfish fishery on deep-sea coral habitats.

Following the NMFS guidance entitled *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Oct 2002), a step-by-step evaluation of habitat impact evaluation was conducted by the Councils.

First, a description of the gears used in this fishery and an evaluation of the spatial distribution of their use in the Northeast region was conducted. Next, the results of scientific studies of the habitat impacts of these gears on different habitat types were summarized and an evaluation was made of the species and life stages of federally-managed species in the region with EFH that was determined to be vulnerable to the effects of different types of fishing gear. This information is presented in Appendix II to this FSEIS.

Twenty-three (23) federally-managed species have been observed or collected in surveys within the Alternative 5AB proposed closure areas, and many of them have EFH defined as hard substrates in depths greater than 200 meters. Furthermore, the EFH designations for juvenile and/or adult life stages of six of these species overlap with the two areas proposed for closure under this alternative, including pollock, redfish, whiting (silver hake), clearnose skate and tilefish. EFH for all six of these species has been determined to be moderately or highly vulnerable to the effects of bottom trawls and minimally vulnerable to bottom gill nets. Corals are not currently included in the EFH descriptions for any species in the Northeast region; however, deep-sea species of coral are known to grow on hard substrates. Since there are corals found with the proposed closed areas, this is indicative of hard bottom and some coral species are thought to function like other epibenthic species that provide relief and shelter, and are known to be particularly vulnerable to damage or loss by bottom trawled and bottom gillnets (Section 5.1.6 and Section 5.4.1.7).

The proposed habitat closures would prevent an expansion of the offshore monkfish fishery into the deeper (>200 meters) portions of Lydonia and Oceanographer canyons, on the southern edge of Georges Bank. By avoiding any direct adverse impacts of bottom trawls and gill nets used in this fishery on EFH for six species of fish and any indirect adverse impacts on hard bottom substrates and species of emergent epifauna, including corals, that grow on those substrates within the boundaries of these two closures, adverse impacts of an expanded offshore fishery would be minimized. Since the fishery is not operating in these two areas at present, there would be no negative economic impact of this alternative. No other fisheries that operate within the closures would be affected by this action. Thus, it is practicable.

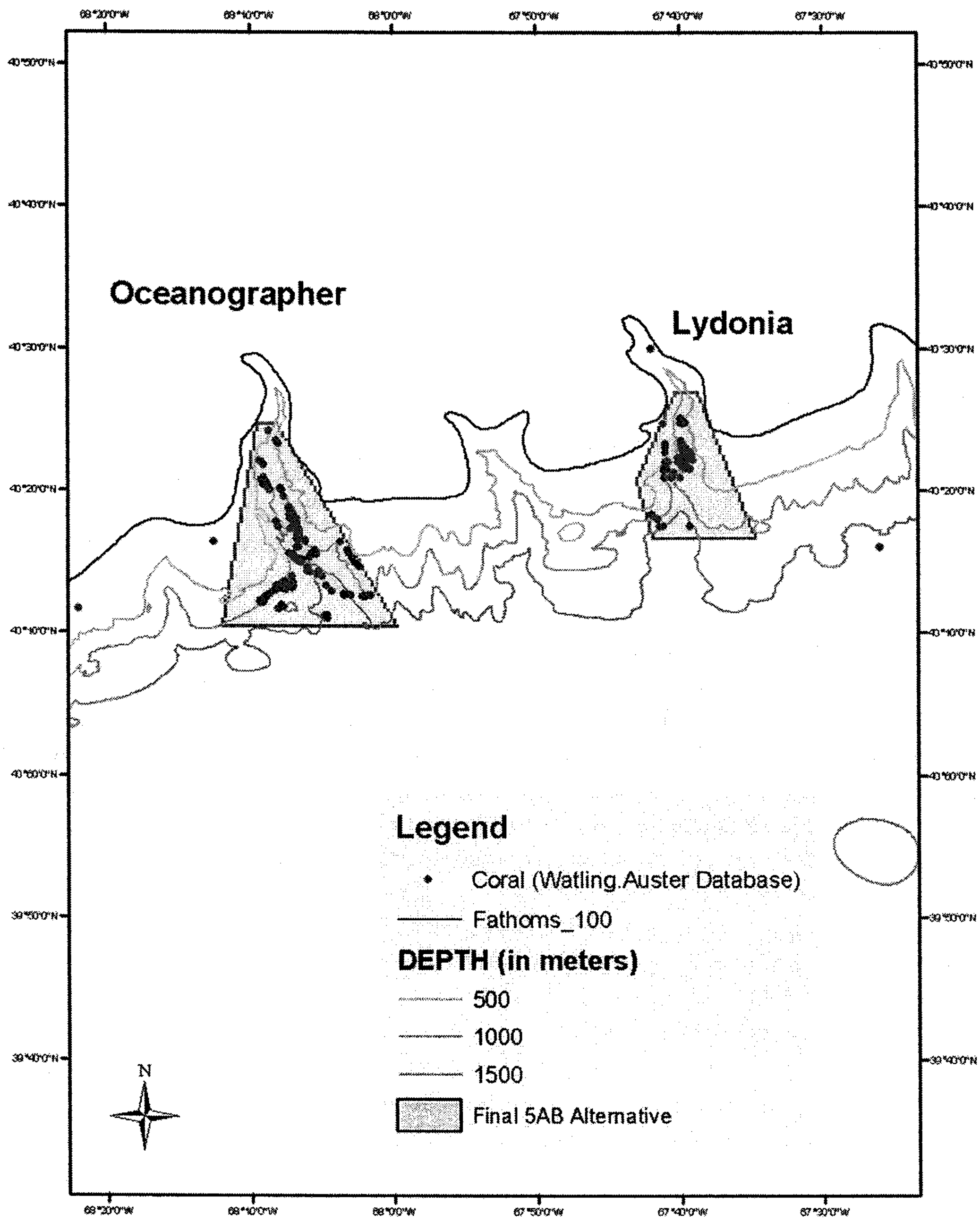


Figure 3 - Habitat Alternative 5 AB (shaded areas in Oceanographer and Lydonia Canyon)
Note that location of known soft coral is mapped as well (Watling and Auster).

4.1.9 Cooperative research programs funding

This is Decision 12 in Appendix I. The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research, and adopted both. Under Alternative 3, no action, vessels that want to participate in cooperative research must either submit an experimental fishery permit application or respond to a NMFS Request for Proposals.

The research that could be conducted under either of these programs includes, but is not limited to: research to minimize bycatch and interactions with sea turtles and other protected species; research to minimize impacts of the fishery on EFH or other sensitive habitats; research or experimental fisheries for the purposes of establishing a trawl exempted fishery under the multispecies FMP in the NFMA; research on the biology or population structure and dynamics of monkfish; cooperative surveys; and gear efficiency.

Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined below.

4.1.9.1 Research DAS set-aside

This is Alternative 1 in Decision 12. A pool of 500 DAS would be set aside from the total monkfish DAS allocated to limited access vessels, excluding any carryover DAS. The Councils would identify research priorities and NMFS would issue a Request for Proposals (RFP) for monkfish research/surveys to be conducted under the DAS set-aside. NMFS Regional Office would conduct a technical review of the proposals and forward the approved proposals to NMFS HQ for further review and awarding of DAS from the set-aside pool. Vessels would, in effect, increase their monkfish DAS allocation by the number of DAS awarded from the set-aside pool, and would conduct the research or survey work while on a monkfish DAS.

Under this option, the DAS allocations to limited access vessels would be reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. With over 700 limited access permits, a substantial and adequate pool of DAS could be set aside by each vessel contributing only a fraction of a DAS.

4.1.9.2 DAS Exemption

This is Alternative 2 in Decision 12. Under this proposal, DAS set aside under the previous program, and not distributed to vessels in response to the RFP would be used to issue DAS exemptions to vessels to conduct monkfish research or surveys. In other words, the total number of DAS allocated under the set-aside program, and this exemption program would not exceed 500 DAS in any year.

In order to qualify for an exemption under this program, a vessel and/or principal investigator would submit a proposal to NMFS via the Experimental Fishery Permit process. The proposal would include, among other elements, a statement of the number of exempted DAS needed to complete the research/survey. If the number of exempted DAS exceeds the quantity analyzed and recommended in this amendment, an applicant would have to prepare an Environmental Assessment for the excess DAS exemptions requested, primarily to determine the impact of any additional fishing effort that could result, in excess of the amount allocated to vessels. Under this program, applicants would not have to submit proposals under the RFP and grants processes, as they would under the previous set-aside program.

Discussion/Rationale: The Councils recognize that scientific information in the areas of monkfish biology, fishery impacts on EFH, bycatch and others is inadequate to effectively manage the fishery. The Councils also recognize that cooperative research programs, where industry and scientific/technical partners jointly investigate particular problems or scientific questions, are the most cost-effective and successful programs, and receive the broadest acceptance. The alternatives proposed above would reduce the costs to vessels, by allowing them to retain monkfish caught during experimental cruises, while not expending the vessels' DAS allocations. By including the exemption or set-aside alternatives in the FMP, the Councils will also streamline the experimental fishery process by obviating the need for individual researchers to apply for such exemptions and conduct the required impact analysis on a case-by-case basis.

The Councils have had a number of successful cooperative research programs, in both monkfish and in other fisheries, in recent years, and are seeking ways to continue and expand these efforts. Most notable in this fishery is the second triennial cooperative survey conducted in the spring of 2004. By providing DAS to vessels, so they can land and sell monkfish caught during experimental fisheries, the Councils are greatly expanding the incentive to participate in a broad range of research and survey activities. The 500 DAS that are identified, if all used, would result in a minimal (less than 1 DAS) reduction in the regular DAS allocation available to vessels, but would provide a substantial pool of DAS to conduct research. Including this program within the FMP, rather than requiring vessels to seek exemptions on an *ad hoc* basis, greatly streamlines the process of starting experimental fisheries work, since an environmental assessment (EA) would not have to be conducted for each project seeking an exemption from monkfish DAS, although an EA may be required if exemptions to other regulations are sought. Allowing vessels to land and sell the monkfish reduces the cost of research, either borne by participating vessels or funding agencies.

4.1.10 Clarification of vessel baseline history

This is Alternative 2, Decision 13 in Appendix I. The Councils are considering a proposal that would eliminate the dual vessel-upgrading baseline that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit. Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented). This proposal would set a single vessel permit baseline at the length, tonnage and horsepower specifications of the first limited access permit applied to the vessel, regardless of whether those specifications are larger or smaller than any subsequent baseline properties. NMFS will only consider making changes under this program if contacted in writing by the vessel owner, and only if such request is made on or before April 30, 2006, or within one year of the effectiveness of this amendment.

Discussion/Rationale: The Councils received early comment about the situation where vessels that were downsized after receiving their initial federal permit had two upgrading baselines. This reduced the value of the vessel in any potential sale, since either the smaller baseline took precedence or monkfish permit had to be relinquished. The Councils recognized that the permit characteristics reflected the vessel at the time the monkfish permit was issued, 1999, and not necessarily the characteristics of the vessel during the permit qualification period (1991-1995).

During the public comment period, however, the Councils also learned that some vessels have a reverse situation due to changes in the method of measuring a vessel's tonnage during the period between the issuance of the permits. In response, they included the stipulation that the change only be done at the request of the vessel owner. The one-year opportunity period is intended to minimize the administrative burden of the permit adjustment program.

4.1.11 No action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13). The rationale for not adopting those measures, and taking no action is discussed under the referenced sections where the non-adopted measures are discussed.

4.1.11.1 DAS usage Alternative 2 (no action) –Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously

This is Decision 1 in Appendix I. Under this no action alternative, vessels in Permit Category C or D (those with both monkfish and either sea scallop or multispecies limited access permits) would continue to be required to use a multispecies and/or sea scallop DAS when on a monkfish DAS. Under this alternative, if a vessel's multispecies DAS are reduced below the number of monkfish DAS allocated (currently 40), the vessel could use those excess DAS (the difference between the monkfish and multispecies DAS) as monkfish-only DAS. In that circumstance, the vessel would fish under the restrictions that apply to Category A or B vessels (gear, area, etc.) when fishing under monkfish (only) DAS.

4.1.11.2 Minimum mesh size Alternative 1 (no action)

This was the preferred alternative in the DSEIS. Under the current system, mobile gear vessels on a monkfish DAS (Category A and B) or on a scallop/monkfish DAS (Category C and D) are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches (stretched measurement). Category C and D vessels on a monkfish/multispecies DAS can use the mesh size specified in the multispecies FMP. Under the terms of the proposed Offshore Fishery Program (see Section 4.1.4), vessels enrolled in the program would be required to use the gear required on Category A and B vessels, even if they are a Category C or D permit with a multispecies limited access permit.

4.1.11.3 NFMA experimental fishery Alternative 1 (no action)

Currently, there is no monkfish trawl exempted fishery in the NFMA, although, a monkfish gillnet exempted fishery already exists. The purpose of the proposed experimental fishery would be to determine whether, and under what conditions a trawl exempted fishery could be established in the Gulf of Maine. If monkfish DAS are separated from multispecies DAS usage requirements, trawl vessels in the NFMA would not be able to target monkfish unless they also used a multispecies DAS, or they propose an experimental fishery through one of the procedures outlined in the alternatives in Section 4.1.9. Since the Councils are not proposing to separate DAS usage requirements, the need for a trawl exempted fishery is minimized, and, further, vessels are already conducting such experimental fisheries under the current program.

4.1.11.4 Fishing year – Alternative 1 (no action)

This was the preferred alternative in the DSEIS. The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP. The fishing year under the Sea Scallop FMP runs from March 1 through February, thus, vessels with monkfish Category C and D permits that also have limited access scallop permits operate under two different fishing years.

4.2 Non-preferred and rejected alternatives

This section is divided into two parts: alternatives that were considered by the Monkfish Committee, but were rejected by the Committee for further analysis prior to preparation of the DSEIS (Section 4.2.1); and alternatives that were analyzed in the DSEIS, presented to the public, but not adopted by the Councils as proposed action items (Section 4.2.2).

4.2.1 Alternatives rejected prior to the DSEIS

The Monkfish Committee considered the following alternatives during the development of this amendment, but did not recommend them to the Councils for consideration and further analysis for the reasons discussed.

4.2.1.1 Single-stock management

In response to scientific inquiry at stock assessment workshops, the Committee considered a single stock approach to monkfish management. The most recent SARC (SARC 34) commented that, while some scientific information suggests there is a single stock throughout the northeast, other information supports the current two-stock approach, and the evidence overall is inconclusive. The SARC noted that the choice of management units is independent of the number of assessment units, but that if it is managed as a single unit (thereby reducing the complexity of the FMP) there is the potential to overfish one stock, if in fact multiple stocks are contained in the management unit. In recognition of this advice, and of the significantly different characteristics of the monkfish fisheries between the two areas, the Committee recommended taking no action on this proposal and retaining the current two-stock assessment and management approach.

4.2.1.2 Individual vessel quotas

The process described in Section 4.2.2.1.1.4 for allocating individual shares of a pool of DAS for the directed fishery could also be applied to allocations of individual vessel quotas. The process of calculating shares would be done as in the Individual DAS alternative, except that baseline shares would be based on pounds landed on directed trips during the baseline period applied to the total landings by contributing (directed) trips. Expected total catch under incidental catch limits would be calculated and deducted from the TAC to determine the total catch available for the individual vessel quotas. As with the individual DAS alternative, quota shares could be leased or sold, with a cap placed on the total share any single vessel could hold in a given year. For enforcement purposes under this option, on trips where vessels would be fishing under their individual quota, the vessel would still be required to call in and identify the trip as a directed trip. The call-in would facilitate quota monitoring and minimum mesh size regulation enforcement. On trips where the vessel does not call in, the incidental catch limits would apply. The Committee's recommendation to not consider this alternative in Amendment 2 is based on members' concerns that developing an IVQ proposal would risk delaying the amendment due to the proposal's complexity, controversy and resource requirements (to fully develop the alternatives).

4.2.1.3 Measures to protect sea turtle/gillnet interactions

The Councils originally considered including in this amendment specific measures to address Goal VI, and specifically the immediate problem of sea turtle catches in the large mesh gillnet fishery south of 38°N. NMFS Protected Resources Division, which has been working with the Plan Development Team toward development of alternative measures, informed the Monkfish Committee that there are no known gear modifications that would be expected to minimize the number or severity of sea turtle interactions with monkfish gillnet gear, and that the analysis of sea surface temperature data (which is essential to developing time/area based measures) is not ready for application to management measures. The Councils are addressing this interaction in this amendment by including actions to address interactions with protected species in the list of actions that can be taken under the framework adjustment process (Section 4.1.6). With this in place, when the temperature data analysis is completed and alternative time/area closure alternatives are developed, or when gear-based alternatives become available, the Councils can consider the alternatives in a streamlined process rather than the more time-consuming amendment process. The Councils note here that the experimental fishery incentives outlined in Section 4.1.9 will help promote research into minimizing fishery interactions with protected species.

4.2.1.4 Modification of permit qualification for south of 38°N

The Committee considered the following options, but following September, 2002 scoping hearings and further analysis it is recommending they not be considered in the amendment. All of these alternatives would have allowed substantially more vessels into the limited access program than the alternatives being considered. (Alternative numbers in this section refer to the alternative number in the original list under consideration by the Committee, and not the alternative numbers in the DSEIS.)

Alternative 3: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP during the four year period prior to June 15, 1998.

Alternative 4: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP during the four year period prior to June 15, 1997.

Alternative 7: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP between March 15 - June 15 during the four year period prior to June 15, 1998.

Alternative 8: Qualify vessels for monkfish limited access permits which landed the qualifying amounts specified in the original FMP between March 15 - June 15 during the four year period prior to prior to June 15, 1997.

4.2.1.5 DAS Counting

The Councils considered three options that would have modified how the first day, or partial days are counted under the monkfish-only DAS system. If monkfish DAS are not separated from multispecies or scallop DAS on Category C and D vessels, then it would be impracticable to count the first day of a trip differently across plans where the DAS are used simultaneously.

4.2.1.5.1 Alternative 1, Option 3a - One landing per calendar day

This option would continue to use the current method of counting actual time between call-in and call-out, but would limit each vessel to only one landing at the per-day trip limit for each calendar day.

4.2.1.5.2 Alternative 1, Option 3b - Count partial days as a 24-hour DAS

This option would count DAS in whole day increments. A vessel on a trip less than 24 hours would have 24 hours deducted from its DAS allocation, and a vessel on a trip longer than one day would have 24 hours deducted from its allocation for the final day of the trip even if the only a partial day was used.

4.2.1.5.3 Alternative 1, Option 3c - Count first day as 24-hour DAS

This option would count the first day of a trip as 24 hours against the vessel allocation, even if the trip were less than one day. On trips over 24 hours, the time counted against the allocation would be actual time between call-in and call-out. In other words, any partial day used at the end of a multi-day trip would be counted as actual time used.

4.2.1.5.4 Alternative 1, Option 3d - No action alternative

Under the current method of counting DAS, vessels other than gillnet vessels are charged actual time between call-in and call-out against their DAS allocation. Vessels can land a per-day trip limit of monkfish for any partial days of a trip. Gillnet vessels are charged a minimum of fifteen hours for trips over three hours, but actual time used for trips less than three hours. A gillnet vessel can land a per-day trip limit for either a trip less than three hours or a trip that charges 15 hours against the DAS allocation. This is the Committee's recommendation for a preferred alternative.

4.2.1.6 EFH Alternative 6 (Tilefish HAPC Closure)

This option proposed closing the Tilefish HAPC to monkfish fishing since tilefish has been defined as a species with EFH vulnerable to bottom tending gear according to the Gear Effects Workshop (2001), and later approved by the NEFMC (Appendix II). According to the spatial locations of the directed monkfish otter trawls trips from 1999 and 2001, a significant portion of them are within the tilefish HAPC. Since this area has been defined as important EFH for tilefish, this option would have prevented monkfish fishing in this area.

There are several pieces of information that may or may not conclude that bottom-tending mobile gear has an adverse impact to tilefish EFH more than minimal and temporary in nature. The Gear Effects workshop (citation) indicated that tilefish EFH, particluarly the pueblo village structures, is vulnerable to bottom-trawling. A MAFMC funded report (Able and Muzeni) concludes, based upon a limited review of video tapes of submersible dives, that there is no evidence that otter trawls adversely impact tilefish burrows through sedimentation. Lastly, the NEFMCs gear effects evaluation ranks tilefish EFH as vulnerable to otter trawling based upon the potential adverse impacts to habitat components other than structure such as impacts to food sources, impacts to reproduction, and impacts to non-burrow structures.

EFH Alternative 6 -Option 1: Closed to trawl gear only (on a monkfish DAS)
EFH Alternative 6 -Option 2: Closed to all gears on a monkfish DAS (trawl and gillnets)

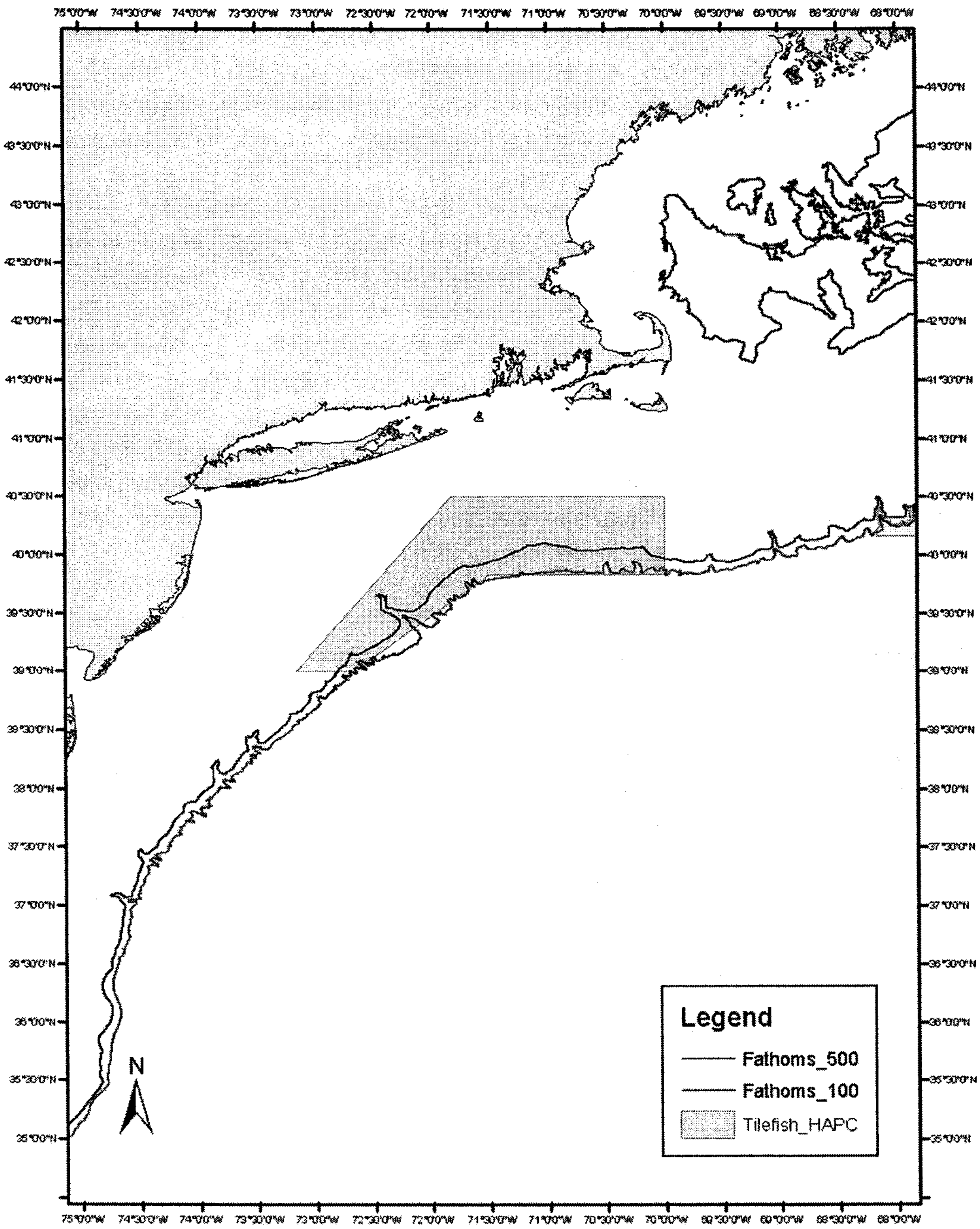


Figure 4 – EFH Alternative 6 – Closure of tilefish HAPC to directed monkfish fishing.

4.2.2 Non-preferred alternatives

This section describes the alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. The discussion under each alternative provides the rationale for the Councils' not adopting these alternatives.

4.2.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered an alternative for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the alternative, all monkfish limited access permit holders would be allocated 40 monkfish DAS. Options were also provided under Alternative 1 that would allocate individual DAS based on past performance in the monkfish fishery. In addition, DAS could be reduced, under the management program implemented in Framework 2, if the SFMA TAC is set below 8,000 mt. In that case, the trip limits would remain fixed at 550 lbs. and 450 lbs. (tails/DAS) for Category A and C, and B and D, respectively. For example, for FY2004 vessels will only have 28 DAS to fish in the SFMA, but can fish 40 DAS in the NFMA (that is, a vessel can fish 28 DAS in the SFMA and the remaining 12 in the NFMA).

4.2.2.1.1 DAS usage Alternative 1 – De-couple monkfish DAS from scallop and multispecies DAS

This is Decision 1 in Appendix I, and was the Councils' preferred alternative in the DSEIS. Under this alternative, Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. The Councils considered two approaches (Decision 1a, Appendix I): separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b).

The following items summarize some of the elements of the de-coupled DAS alternatives that the Councils considered in the DSEIS:

1) Under either Alternative 1a or 1b, a vessel that is enrolled in a separated DAS program has the option to fish on a combined DAS on a trip-by-trip basis. When calling in to start the trip, a vessel that is enrolled in a separated DAS program would indicate if it is using a monkfish only DAS or a combined (monkfish/multispecies or scallop) DAS.
2) All Category C and D vessels would be allocated monkfish DAS. Options are presented below for Individual or Fleet Monkfish DAS allocations (Decision 1b, Appendix I).
3) As under the current program, vessels would be required to declare into the NFMA to fish under the less restrictive trip limits and different minimum fish size (if applicable, Section 4.1.2).
4) Vessels that enroll in the offshore fishery program (if adopted, see Section 4.1.4) would have separate MF only DAS allocations and not be able to participate in this "choice" program since enrollment in the offshore program is on an annual basis.

5) An experimental fishery would have to be established for trawl vessels fishing on a monkfish (but not a multispecies) DAS in the NFMA (see Section 4.2.2.12) with the purpose of establishing a trawl exempted fishery (in accordance with the multispecies FMP regulations) in the NFMA.
6) Scallop and multispecies limited access vessels, when fishing under monkfish only DAS would fish under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS (see Section 4.2.2.3).

Discussion/rationale: This discussion incorporates both the Councils' rationale for initially considering this alternative as a preferred alternative and for their ultimate rejection of it as a proposed action following public comment. Following the discussion of Councils' rationale for rejecting this alternative, there is a complete description of the alternatives that the Councils were considering to further define the de-couple DAS management program. Since they rejected the overall alternative, no further discussion is provided beyond the description of alternatives.

Rationale for the preferred alternative: The Councils believed that these alternatives would meet the goals of addressing problems created by implementation of the FMP, and addressing deficiencies in meeting Magnuson-Stevens Act requirements (particularly bycatch and EFH requirements, as well as achieving optimum yield). Having separated DAS will enable the Councils to address monkfish management issues such as bycatch and EFH impacts directly through gear requirements on monkfish DAS, rather than defaulting to the multispecies and scallop regulations on Category C and D vessels (the majority of monkfish limited access permits) when vessels are on a combined DAS (as under the current system). Having a fishery that is directly controlled by regulations specific to the monkfish fishery will also allow managers to exercise more control over monkfish effort in achieving optimum yield, since that effort will no longer be indirectly, and sometimes unintentionally controlled by the regulations implemented to manage effort in multispecies or scallop fisheries.

If vessels have the option of using monkfish only DAS, the opportunity cost of fishing for monkfish would be reduced on many vessels, especially those fishing in the SFMA, since they would not have to use a multispecies or scallop DAS, and could target monkfish and groundfish separately. Vessels fishing in the SFMA, can specifically direct on either monkfish or multispecies without significant catches of the other, making separate DAS more practicable. Fishermen from the NFMA, however, have commented that monkfish is a component of their multispecies catch, and it would be difficult for them to fish for monkfish separately without causing discards. Furthermore, for many vessels in the NFMA, the no action alternative provides more opportunity to fish for monkfish with no trip limit than either of the proposed alternatives because their multispecies DAS allocations exceed their monkfish DAS. For NFMA trawl vessels, until, and only if a monkfish exempted trawl fishery can be established, those vessels could not use their monkfish only DAS in the NFMA, and may elect to shift to the SFMA to use their monkfish only DAS, potentially slowing the southern stock rebuilding.

Rationale for Councils' rejection of this alternative: The Councils heard nearly unanimous opposition to separating DAS in public comment, and from the Advisory Panel and Monkfish Committee. The public, advisors and Committee members were extremely concerned about the potential increase in fishing effort that would result if vessels were not required to use either a multispecies or scallop DAS when targeting monkfish. This increase in effort could have a negative impact on the monkfish rebuilding program, as well as on other the rebuilding of other species, particularly groundfish stocks, as a result of multispecies DAS being freed up. Active monkfish vessel owners were concerned that as a result of the increased overall effort, their trip limits and DAS allocations would have to be reduced to accommodate the new effort within the confines of the rebuilding program. Furthermore, many commenters were concerned with the evolution of the multispecies effort management system, allowing vessels to target monkfish while on a multispecies "B" day (see Section 2.9.2), and the potential effect that change would have on overall monkfish effort. The Councils, in consideration of these comments, rejected this alternative, and decided to take no action on separation of DAS usage requirements.

The Councils also considered the impact of this alternative on skates and EFH in rejecting it for further action. Since the action would potentially increase overall effort levels, the Skate FMP requires that the Skate PDT prepare a baseline review, which was presented to the Councils prior to their making a final decision (Section 6.2.2.2). The analysis of impacts of decoupling DAS on EFH is contained in Section 6.3.2.1.

The following subsections describe the alternative elements of the de-coupled DAS program that the Councils were considering.

4.2.2.1.1.1 De-coupled DAS Alternative 1a (SFMA only)

This is part of Decision 1a in Appendix I. Under this alternative, a Category C or D vessel would declare annually (when renewing its permit) that it intends to retain the option to fish under monkfish only DAS in the SFMA only. The vessel may declare on a trip-by-trip basis to fish on a combined (multispecies or scallop) DAS or a monkfish only DAS, but may only fish on a monkfish DAS (combined or not) in the SFMA (see Table 11). If a vessel that has declared into the SFMA intends to fish in the NFMA (for example, under multispecies or scallop DAS), then it would fish under the applicable incidental catch limits. In other words, while a Category C or D vessel may fish in the NFMA with no monkfish trip limit while on a multispecies DAS, a vessel that has declared into the SFMA for separation of DAS would only be able to fish under the regulations applicable to Category E vessels in the NFMA, and could not obtain an NFMA exemption authorization letter. A vessel that has not declared into the SFMA would fish under the regulations that apply under Alternative 2 (the no action alternative).

4.2.2.1.1.2 De-coupled DAS Alternative 1b (Annual declaration) (preferred alternative in the DSEIS)

This is part of Decision 1a in Appendix I. Under this alternative, any Category C or D vessel would declare annually its intent to retain the option to fish under a monkfish only DAS. This alternative differs from Alternative 1a in that vessels would not be restricted to fishing on a monkfish DAS (combined or not) in the SFMA. A vessel that declares into the program would have the ability to call-in a monkfish-only DAS or a combined DAS when starting the trip, and could fish in either area, subject to any area-specific rules and restrictions that apply (see Table 11). A vessel that has not declared into the de-coupled DAS program would fish under the regulations that apply under Alternative 2 (the no action alternative).

The following table (Table 11) summarizes the regulations and options applicable to vessels that have declared into the de-coupled DAS programs under either Alternative 1a or 1b. A vessel that has not declared into the program would fish under the regulations applicable under Alternative 2.

NFMA (Alt. 1b only)	**DAS**	**GEAR**	**MF Trip Limit (tail wt.)**	**MS Trip Limits**
MF only (For trawls, requires exempted or experimental fishery)	Fleet or Individual (2 Options)	Large Mesh or MF trawl	None	Zero
MS only (any day not using a MF DAS)	MS Regs.	MS Regs.	Lesser of: 400 lbs./50% wt. FOB	MS Regs.
Combined (MS or scallop not using dredge)	Lesser of MF Fleet or Individual DAS or MS DAS (if MS DAS are less than MF DAS, remaining MF DAS must be MF only)	MS Regs. or Large Mesh or MF trawl (3 Options)	None	MS. Regs.

SFMA	**DAS**	**Gear**	**MF Trip Limit (tail wt.)**	**MS Trip Limits**
MF only	Fleet or Individual (2 Options)	Large Mesh or MF trawl	(2003) 1,250/1,000 lbs. – set annually	Zero
MS only	MS Regs.	MS Regs.	Trawls: Lesser of: 300 lbs./25% wt. FOB Non-trawl: 50 lbs. or 50 lbs. per day/150 or 500 lbs. max.	MS Regs.
Combined (MS or scallop not using dredge)	Lesser of MF Fleet or Individual DAS or MS DAS (if MS DAS are less than MF DAS, remaining MF DAS must be MF only)	MS Regs. or Large Mesh or MF trawl (3 Options)	(2003) 1,250/1,000 lbs. – set annually	MS Regs.

Table 11 Summary of regulations applicable to vessels declared into de-coupled DAS programs under Alternative 1a (SFMA only) or 1b (either area).
Table shows applicable rules on vessels trip declaration to fish on a monkfish, multispecies or combined DAS. Vessels that do not declare into a de-coupled DAS program, under either 1a or 1b, would fish under the current rules (no action alternative).

The Councils considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform ("fleet") allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery. The NEFMC did not identify a preferred alternative, while the MAFMC identified Option 1a (Fleet DAS) as preferred.

4.2.2.1.1.3 Alternative 1, Option 1a – Fleet DAS allocations

This is part of Decision 1b in Appendix I. This option would assign DAS uniformly within permit categories to all vessels with limited access monkfish permits. This is essentially the current program, but applied to monkfish-only DAS. Initially, all vessels would be allocated 40 monkfish only DAS. As noted, the MAFMC identified this as the preferred alternative, while the NEFMC did not select either option.

The Councils considered two options for allocating Fleet DAS and associated trip limits, as follows:

Option 1a(1) - Variable trip limits/uniform DAS: Uniform DAS allocations across permit categories, and differential trip limits between management areas and between Categories A/C and B/D to reflect higher initial qualification criteria. This is the current system of distributing the TAC (no action alternative).
Option 1a(2) - Uniform trip limits/variable DAS by permit category: Uniform trip limits across all permit categories within each management area, with Category A and C DAS allocations greater than Category B and D DAS to reflect the higher initial qualification criteria. NOTE: Option 1a(2) is not practicable at this time because the variable Fleet DAS allocations cannot be calculated with available data and is, therefore not analyzed further in this SEIS.

4.2.2.1.1.4 Alternative 1, Option 1b – Individual DAS allocations

This is part of Decision 1b in Appendix I. This option would distribute, based on past participation in the monkfish fishery, individual shares of a total pool of DAS for the directed fishery according to the method described below. This option assumes that the directed monkfish fishery is the residual claimant to an annual target TAC (i.e. after accounting for expected catch in non-directed fisheries). As with Option 1a, on vessels fishing in the NFMA, where there is currently no trip limit on limited access (monkfish vessels) fishing on a multispecies DAS, incidental catch limits are based on analysis of monkfish catch on vessels fishing on multispecies DAS. For the SFMA, it will apply the current incidental catch limits, or any changes to incidental catch limits proposed in this amendment. The total expected catch on trips not on a monkfish DAS under the incidental catch limits is subtracted from the TAC to determine the total portion of the TAC that would be available to the directed fishery in each area, and subsequently the DAS and trip limits that would apply on monkfish-only DAS.

The process of distributing individual DAS would go through the following steps:

Step1. Establish individual vessel baseline share of DAS (percentage of the total pool of available DAS) based on level of participation in the monkfish fishery. Qualifying days are based on cumulative effort (days absent or DAS) over the qualifying period when monkfish was 40, 50, or 60 percent or more of total weight of fish on board (where "weight" refers to live weight equivalent). The qualification period for determining baseline DAS shares is 1997-2001, including both pre- and post-FMP effort.

Qualification options:

Qualification Option 1: days are counted when monkfish was **40 percent** or more of the total weight of fish on board. Total number of days in the pool = **25,000.**

Qualification Option 2: days are counted when monkfish was **50** percent or more of the total weight of fish on board. Total number of days in the pool = **20,000.**

Qualification Option 3: days are counted when monkfish was **60** percent or more of the total weight of fish on board. Total number of days in the pool = **17,000.**

The purpose of establishing qualification criteria is for calculating individual vessel shares of the total pool of DAS. Each vessel's share would be calculated by dividing that vessel's number of days at or above qualification criterion by the total number of days in the pool. The lower the qualification threshold (for including days in the total pool), the more days would be included in the denominator, and, therefore, would distribute the pool of available DAS across more vessels. If all of a vessel's qualifying days qualify at the highest level, for example, that vessel would have a lower share at the lower qualification threshold since the same number of qualifying days would be divided by a larger pool. On the other hand, some vessels would see their shares increase because of the lower qualification and the larger number of days they contribute to the numerator. The shares equate to a percentage of a total pool of DAS available for the directed fishery, calculated in Step 2.

Step 2. The total DAS available depends on the target TAC in any given year after subtracting out the expected catch of monkfish not on a DAS, that is, fishing under incidental catch limits. The pool of available DAS is calculated by dividing the directed fishery component of the TAC by the average catch per DAS on directed monkfish trips. For the purpose of this analysis, the SFMA incidental catch is based on the total monkfish catch on vessels not on a monkfish DAS. In the NFMA, however, where there is no trip limit on a Category C or D vessel fishing on a multispecies DAS, the same criterion cannot be applied. In this case, the incidental catch portion of the TAC was calculated by adding the catch on all trips below the Category E trip limit, that is, the lesser of 50 percent of total weight of fish on board, or 400 lbs./DAS. Using the FY2003 TACs as an example, the pool of DAS would be calculated as follows:

	2003 TAC (1,000 lbs)	Incidental Catch (1,000 lbs)	Directed Fishery TAC (1,000 lbs)	Average catch/DAS (lbs.)	DAS pool
NFMA	39,039	3,500	35,539	2,000	17,769
SFMA	22,511	6,500	16,011	1,400	11,436

Table 12 Calculation of Individual DAS pool using FY2003 TACs.

The total DAS pool to be allocated to individual DAS vessels would be 17,769+11,436=29,025.

Step 3. Allocation per vessel is then determined as the product of the baseline share and total allowable DAS. NMFS will inform vessel permit holders of their individual shares prior to public hearings.

The PDT conducted a preliminary analysis (because the final distribution would be based on the outcome of appeals) using Qualification Option 1 (counting days where monkfish comprised 40 percent of the total weight of fish on board during the 1997-2001 qualification period). The analysis shows that a total of 40 vessels would account for a 20 percent share of the total pool of DAS share. A total of 96 vessels would account for a 40 percent share (note both vessel count and share are cumulative, that is the 96 vessels includes the 40 vessels in the first statement). A total of 129 vessels would have a 50 percent share, and 196 vessels would account for 66.7 percent of the total pool. Since there were a total of 726 vessels included in the analysis (that is, they had qualifying days), and 581 vessels would account for 100 percent of the total pool, 145 vessels would get no share at all.

To illustrate these percentages so that they can be additive: 40 vessels accounted for the first 20 percent (average share of 0.5 percent); 56 vessels accounted for the next 20 percent (average share of 0.36 percent); 33 vessels accounted for the next 10 percent (average share of 0.3%); 67 vessels accounted for the next 16.7 percent (average share of 0.25 percent); and 385 vessels accounted for the last 33.3 percent (average share of 0.09 percent). As noted, this leaves145 vessels that would receive no share.

Note that if a different qualification criterion were used, such as counting only days where monkfish was 50 percent of the total weight of fish on board, the total pool of days would be smaller and fewer vessels would qualify for shares. The distribution of shares, however, would still be skewed because a relatively small number of vessels account for the majority of monkfish landings (many vessels land relatively small proportions of the total, while a few vessels land comparatively large proportions).

Step 4. Vessels would be provided an opportunity to appeal individual share allocations and would fish under the fleet allocation (40 DAS) during the first year pending resolution of appeals.

4.2.2.1.1.5 Alternative 1, Option 2a - Implement transferable MF-only DAS under the Amendment 2 rule

This is part of Decision 1c in Appendix I. If DAS are separated, under Alternative 1, whether allocated as fleet or individual MF only DAS, a vessel owner could transfer its monkfish-only DAS to another permitted vessel. This option would implement, as a component of the separated monkfish DAS provision of this amendment (if adopted), a procedure to enable vessels to transfer, their monkfish DAS allocations, including conditions, restrictions and other parameters as outlined in the DSEIS for Amendment 13 to the Multispecies FMP, with appropriate monkfish-specific considerations. Of the following three alternatives, no action, DAS leasing and DAS sale, the Councils did not identify a preferred alternative, but indicated their preference that DAS transfer not be implemented as part of the Amendment 2 rule but that it be considered in the future under the framework adjustment process.

4.2.2.1.1.5.1 Transferable DAS Option 1 (no action)

This is part of Decision 1d in Appendix I. Current regulations do not provide for separation of the DAS from the vessel permit, and, therefore, do not allow for leasing or sale of monkfish DAS.

4.2.2.1.1.5.2 Transferable DAS Option 2 (leasing)

This is part of Decision 1d in Appendix I. This alternative, and its various options described in this section is adapted from the DAS leasing alternative under consideration in the Multispecies FMP Amendment 13.

The following elements would form the basis for a leasing program that would not necessarily be affected by measures that may affect limits on DAS exchanges to assure conservation equivalency, as described below.

Common Elements

Term of Lease: DAS would be leased for only one fishing year.

Multiple vessel transactions: Vessels may lease DAS from more than one other vessel (conversely vessels may lease DAS to more than one vessel) subject to conservation equivalency provisions.

Lease units: DAS may be leased on a unit basis where a unit is defined as being 1 DAS or 24 hour increment.

Conservation tax: Leases would not be subject to a "conservation tax."

Renewal of Lease: Vessels may renew leased DAS on an annual (fishing year) basis.

Required Use: Leased DAS must be used in the same fishing year they are acquired.

Prohibition on Carry-Over: Leased DAS may not be used as part of any carry-over.

Limit on Leasing by Category: DAS available for leasing shall be limited to only Category A DAS; DAS that may be immediately available for use. (Note: this element is contained in the Multispecies Amendment 13 leasing proposal, but is not applicable in the monkfish fishery since DAS are not categorized.)

Registration of Leases: Lease agreements must be registered with the NERO. Administrative process based on two possible approaches 1) internal administration by NERO or 2) external administration by approved "brokers" (for example, permit brokers could be sanctioned by NERO to document exchanges and provide data to NERO for monitoring and enforcement purposes) to be developed.

Permit History: the lease agreement must clearly state which permit retains the history of the leased DAS

Conservation Equivalency (CE) Alternatives

CE Option 1: Leasing Within Size Categories
A lessor may not lease DAS to any vessel with a main engine horsepower rating that is more than 20% that of the lessee and may not lease DAS to any vessel that is more than 10% of the lessee's vessel's LOA, GRT, and NT.

Sub-Leasing DAS

There are two options for sub-leasing of DAS:

Sub-leasing Option A: DAS cannot be sub-leased
Sub-leasing Option B: DAS can be sub-leased

CE Option 2: Calibrated DAS
Creating a standardized measure to calibrate effective effort (hereafter referred to as a *calibration factor*) across vessel sizes would provide broader opportunities to match buyers and sellers of leased DAS. Calibration of DAS across vessel platforms needs to take into account the potential difference in capacity output of each vessel to assure that DAS trades are capacity neutral. Such capacity output measures were developed as part of the latent multispecies permit buyout and provide a basis for developing a calibration factor for leasing DAS. For the latent permit buyout, capacity estimates for inactive vessels were based on the average capacity output per DAS for active vessels for six different vessel horsepower clusters. These average values may then be used to develop a schedule of calibration factors to determine the number of potential DAS that may be exchanged (note that this approach is identical to what was developed for Amendment 7 to the Scallop FMP).

Sub-leasing DAS

There are two options for sub-leasing of DAS:

Sub-leasing Option A: DAS cannot be sub-leased
Sub-leasing Option B: DAS can be sub-leased

CE Option 2A: With this option, DAS leases would be subject to the calibration factors in Table 13. Since the calibration factors in Table 13 and Table 14 were not developed specifically to accommodate a leasing program they should be regarded as preliminary and may be adjusted upon further review by the PDT. The number of horsepower classes may also need to be adjusted.

These calibration factors provide for both upward and downward adjustments to DAS based on the buying and selling vessel's horsepower class. A selling vessel in any given class would be able to lease DAS to a buying vessel in the same class at a 1:1 rate. A selling vessel in any given class would be able to lease DAS to any vessel in a lower class at a higher rate but would be able to lease DAS to any vessel in a higher class at a lower rate. For example, if a vessel in the 251-324 horsepower class had 10 DAS available to lease, that vessel could lease exactly 10 DAS to another vessel in the same class. If the same vessel were to lease to a vessel in the 176-250 horsepower class then the buying vessel would receive 11.4 DAS. From a DAS accounting perspective, the selling vessel would have its DAS reduced by 10 DAS while the buying vessel would have its DAS allocation increased by 11.4 DAS.

		Selling Vessel Horsepower Class					
		0-175	176-250	251-324	325-400	401-650	651+
Buying Vessel Horsepower Class	0-175	1.00	1.25	1.42	1.72	2.05	2.76
	176-250	0.80	1.00	1.14	1.37	1.63	2.20
	251-324	0.70	0.88	1.00	1.21	1.44	1.93
	325-400	0.58	0.73	0.83	1.00	1.19	1.60
	401-650	0.49	0.61	0.70	0.84	1.00	1.35
	651+	0.36	0.45	0.52	0.62	0.74	1.00

Table 13– Option 2A for calibration of DAS between vessels

CE Option 2B: Allowing upward adjustments places a significant burden on the precision of the estimated capacity output by horsepower class that is used to calculate the calibration factors. A more precautionary approach would be set all DAS calibration factors for DAS leases from a larger vessel to a smaller vessel equal to one. The calibration factors that would be associated with this option are shown in Table 14. Under this option any vessel within one horsepower class that was leasing DAS from a vessel in a higher class would lease DAS at a 1:1 rate. Vessels leasing DAS from any vessel in a lower horsepower class would lease DAS at less than a 1:1 rate. For example, a vessel in the 176-250 horsepower class would lease DAS at a 1:1 rate from any vessel in the same or higher horsepower class. However, if this vessel were to lease DAS from a vessel in the 0-175 horsepower class then the DAS would be leased at a 0.8:1 rate. For an exchange of 10 DAS in this case the selling vessel's DAS allocation would be reduced by 10 DAS and the buying vessel's allocation would be increased by only 8 DAS.

		Selling Vessel Horsepower Class					
		0-175	176-250	251-324	325-400	401-650	651+
Buying Vessel Horsepower Class	0-175	1.00	1.00	1.00	1.00	1.00	1.00
	176-250	0.80	1.00	1.00	1.00	1.00	1.00
	251-324	0.70	0.88	1.00	1.00	1.00	1.00
	325-400	0.58	0.73	0.83	1.00	1.00	1.00
	401-650	0.49	0.61	0.70	0.84	1.00	1.00
	651+	0.36	0.45	0.52	0.62	0.74	1.00

Table 14– Option 2B for calibration of DAS between vessels

Limitations on Number of DAS Leased

Limitations Option 1: A vessel would be allowed to lease from other vessels not more than 50 percent of its Amendment 2 allocation (not including carry-over DAS).

Limitations Option 2: A vessel would be allowed to lease from other vessels not more than its Amendment 2 allocation (not including carry-over DAS).

Limitations Option 3: A vessel would not be allowed to lease from other vessels more days than 365 minus its Amendment 2 allocation (including any carry-over DAS). In other words, the total number of leased and allocated DAS could not exceed 365, including any carry-over.

Permit History Provisions
To clarify the implications of leasing DAS on permit history, the following policies will be followed:

- The history of DAS use remains with the permit that "owns" the DAS (that is, the lessee retains the DAS history of any DAS leased to another vessel –even after the DAS are leased).
- Any landings associated with leased DAS remain with the permit that lands the fish.
- If a vessel does not use all the DAS that are allocated to it and that it leases, the DAS will be considered used in the following order (one alternative will be selected by the Council:

Permit History Option A: Leased DAS are considered used first
Permit History Option B: Leased DAS are considered used last

Expiration of a Leasing Program

There are two options for the duration of the proposed leasing program
Expiration Option 1: Any adopted DAS leasing program will continue indefinitely unless changed by a future Council action.

Expiration Option 2A: Any adopted DAS leasing program will automatically expire after a **two to five** year period unless extended by a future Council action. The length of the period will be determined after considering public comment on this Amendment. If an expiration date is adopted, there is no guarantee that a DAS leasing program will be renewed.

Expiration Option 2B: Any adopted DAS leasing program will automatically expire after a **one-year** period unless extended by a future Council action.

Confirmation of Permit History
Any permit in the permit history category cannot lease DAS to an active permit.

4.2.2.1.1.5.3 Transferable DAS Alternative 3 (sale of DAS)

This is part of Decision 1d in Appendix I. This alternative would allow monkfish permit holders to sell monkfish DAS to other monkfish limited access vessels based on the program developed for Multispecies Amendment 13 and taking into account any monkfish-specific considerations.

Measures
All transfers of DAS are limited to monkfish limited access vessels. The LOA or gross registered tonnage of the purchasing vessel may not be more than 10% greater and its

horsepower may not be more than 20% greater than the baseline of the selling vessel. The selling vessel is required to retire from all state and federal commercial fisheries. Consistent with the DAS leasing program, a history permit cannot transfer its DAS to another vessel.

Option 1: Adopt the transfer provisions without a flat rate reduction in DAS transferred from smaller to larger vessels.

Option 2: Adopt the transfer provision with the condition that DAS transferred from smaller to larger vessels are subject to a substantial flat rate reduction based on the following formula: In a transaction between selling Vessel A (smaller) to buying Vessel B (larger), DAS available to Vessel B after transfer = 30% of Vessel A's active DAS + 5% of Vessel A's inactive DAS.

Restrictions

Category 3 vessels (that is, those with any landings of monkfish during the time period used to define active DAS) and Category 2 vessels (that is, those with any landings of any species during the time period used to define active DAS) may transfer DAS with some reduction in fishing privileges for the recipient, as described below:

Option 1: Transferred active DAS will be reduced by 40% and inactive DAS will be reduced by 90%.
Option 2: No reduction in the number of active or inactive DAS transferred.

For the purpose of this alternative, **active DAS** are determined based on the definition of "effective effort" chosen in Amendment 13. If an alternative which defines active DAS is *not* chosen for Amendment 13, active DAS will be defined according to one of the following two options:

Option 1: Active DAS are the maximum days used (not to exceed current DAS allocations) as determined by the call-in system or days absent computed from the VTR on trips where monkfish were landed, from fishing years 1994 to 1999.

Option 2: Active DAS are days on which more than 10% of landings by weight (as reported in the VTR) was composed of monkfish (tail weights converted to whole weights) from fishing years 1994 to 1999.

In this document the terms *active DAS* and *effective effort* are used interchangeably.

Reactivation of DAS – (DAS Use by Permit Buyer)

All DAS acquired by a vessel under this alternative may not be used immediately following the transaction. Instead, they will be made available to the permit recipient according to the following reactivation schedule:

Option 1: **Phase-In of DAS**

20% of the DAS acquired (after a conservation tax is applied) could be reactivated each year. In other words, a vessel would be allowed to use only 20% of the DAS it bought in the first year, 40% the next year, 60% the next, and so forth.

The Council may increase the rate at which the DAS could be activated each year through a framework adjustment.

Option 2: **Immediate Use of DAS**

DAS may be used in their entirety at any time following the transaction.

4.2.2.2 Trip/possession limits for incidental catch

The Councils considered alternatives for modifying the allowable retention of monkfish incidental catch by vessels in various fisheries.

4.2.2.2.1 Alternatives to the 50 lbs./trip incidental catch limit

This is Decision 2 in Appendix I. The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted one (Alternative 2). In addition, the Councils propose to apply this limit to surf clam dredge and General Category scallop dredge vessels, rejecting the no action alternative. In a separate alternative, for the purpose of applying the monkfish incidental catch limit on "large-mesh trips", as described in Section 4.1.1.3, the Councils recommend returning to the boundary between the Mid-Atlantic and Southern New England Regulated Mesh Areas to its location prior to groundfish interim rule (this change would only apply to the monkfish incidental catch limit and not other regulations that apply in each area). The following describes the non-preferred alternatives, and the rationale for rejection.

4.2.2.2.1.1 Incidental catch Alternative 1 – 50 lbs. (tails) per trip (no action alternative)

The incidental catch limit is 50 lbs. (tails) per trip on all vessels not on a DAS and fishing with small mesh (defined as mesh smaller than multispecies minimum mesh in the GB/GOM and SNE Regulated Mesh Areas, and fluke minimum mesh, specified in §648.94 (c) (3)(i), in the Mid-Atlantic regulated mesh area) and handgear. The same limit applies on multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used. The incidental catch limit is up to 5 percent of the total weight of fish on board on vessels using large mesh (that is, fluke mesh in the Mid-Atlantic Regulated Mesh Area and multispecies mesh elsewhere) when not on a DAS.

4.2.2.2.1.2 Incidental catch Alternative 3 – 50 lbs. (tails) per day/500 lbs. maximum

Vessels would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 500 lbs.. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

4.2.2.2.2 General Category scallop dredge and clam dredge incidental limit – Alternative 1 (no action)

This is Decision 3 in Appendix I. Currently, general category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish. General Category scallop dredge vessels are an open access permit category in which vessels are restricted to a possession limit of 400 pounds of scallop meats. Clam dredge vessels are managed under an Individual Transferable Quota (ITQ) system, and harvest surf clams and ocean quahogs with a hydraulic dredge. The Councils are proposing including these two vessel groups under the small mesh incidental limit (50 lbs./day up to 150 lbs. maximum).

4.2.2.2.3 Incidental catch limit on summer flounder vessels west of 72°30'W (no action)

This is Alternative 1, Decision 4 in Appendix I. The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to the amounts that were allowed prior to the 2002 interim rule implementing changes to the Multispecies FMP.

The Monkfish FMP specifies that "large mesh" (for the purpose of determining the applicable monkfish incidental catch limit) in the Mid-Atlantic Regulated Mesh Area is that which is specified under the Summer Flounder FMP, or 5.5-inch diamond/6-inch square. The Multispecies interim rule shifted the large-mesh multispecies line (SNE/MA Regulated Mesh Areas boundary) from 72°30'W to 74°00'W. Consequently, the area east of 74°00'W is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30'W and east of 74°00'W went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip.

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1. The Councils rejected the 500 lbs. maximum alternative (Alternative 3, Decision 2) because of a lack of evidence that affected vessels actually have a monkfish bycatch problem that would not be adequately addressed by the selected alternative (150 lbs. maximum), and to minimize the incentive to target monkfish with small mesh.

4.2.2.3 Minimum trawl mesh size on directed MF DAS

This is Decision 5 in Appendix I. The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, including the no action alternative that they adopted. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

For mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

4.2.2.3.1 Minimum trawl mesh size Alternative 2

Under this option, trawl vessels on a monkfish DAS would be required to use 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net. This would apply on Category A and B vessels, and on Category C and D vessels with a scallop limited access vessel, fishing on a combined scallop/monkfish DAS. If DAS were de-coupled, the Councils were considering one of two options for Category C and D vessels fishing under the optional combined multispecies/monkfish DAS.

4.2.2.3.1.1 Mesh Alternative 2 Option 1

Alternative 2 mesh size would apply on monkfish only DAS, but not on combined monkfish/multispecies DAS.

4.2.2.3.1.2 Mesh Alternative 2 Option 2

Alternative 2 mesh sizes would apply on combined multispecies/monkfish DAS.

4.2.2.3.2 Minimum trawl mesh size Alternative 3

This option is similar to the previous option, except that the applicable mesh in the body of the trawl net would be the minimum mesh that applies on multispecies vessels. The mesh that applies in the codend would be 12-inch square mesh, or its nearest metric equivalent. This would apply on Category A and B vessels, and on Category C and D vessels with a scallop limited access vessel, fishing on a combined scallop/monkfish DAS. As with Alternative 2, if DAS were de-coupled, the Councils were considering one of two options for Category C and D vessels fishing under the optional combined multispecies/monkfish DAS.

4.2.2.3.2.1 Mesh Alternative 3 Option 1

Alternative 3 mesh size would apply on monkfish only DAS, but not on combined monkfish/multispecies DAS.

4.2.2.3.2.2 Mesh Alternative 3 Option 2

Alternative 3 mesh sizes would apply on combined multispecies/monkfish DAS.

Discussion/Rationale: The Councils considered increasing the minimum mesh size requirement on monkfish trawl vessels primarily to minimize the bycatch of small monkfish and of other species. However, minimizing or eliminating the ability of a large-mesh monkfish net to catch other species, particularly regulated multispecies, reduces the incentive to fish in areas where they otherwise might have a component catch of other species, with commensurate benefits to the EFH of those other species. Increased mesh sizes also have the effect of shifting the exploitation pattern to larger fish, increasing the yield-per-recruit (average weight of fish in the catch). Gillnet vessels fishing with 10-inch minimum mesh do not appear to have the same bycatch problems as trawl vessels, and, furthermore, many gillnet vessels actually use meshes larger than the minimum size, according to anecdotal reports.

While the Councils considered increasing the trawl minimum mesh size to address both bycatch of small monkfish and of other species, the preferred alternative in the DSEIS was no action. The basis for this preference is that data is not yet available to quantify the benefits, and, in the case of regulated species, bycatch issues are addressed by the exempted fishery program requirements (that is, regulated multispecies must bycatch must not exceed 5 percent of the total catch for a fishery to qualify as a multispecies exempted fishery). Most of the industry advisors (that is, who fish with gillnets) and the Monkfish Committee recommended Alternative 3.

Under the current rules, which the Councils are not proposing to change, mobile gear vessels on a monkfish DAS (Category A and B) or on a scallop/monkfish DAS (Category C and D) are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches (stretched measurement). Category C and D vessels on a monkfish/multispecies DAS can use the mesh size specified in the multispecies FMP. Under the terms of the proposed Offshore Fishery Program (see Section 4.1.4), vessels enrolled in the program would be required to use the gear required on Category A and B vessels, even if they are a Category C or D permit with a multispecies limited access permit. In discussing the final action on this alternative, one Council member noted that, even though no scientific studies have document the selectivity of 12-inch square mesh on groundfish, his experience has been that there is virtually no groundfish bycatch with the 10-inch square mesh. This observation was supported by a member of the advisory panel who is currently involved in a cooperative research project examining the selectivity of 10-inch mesh. Furthermore, while 12-inch mesh may catch fewer sub-legal sized monkfish than 10-inch square mesh, it also likely reduces the catch of legal sized monkfish, creating inefficiencies and an incentive to strategize ways to minimize those losses. The Councils also noted that with the proposed reduction in minimum fish size in the southern area (from 14 inches to 11 inches, tail length), the number of sublegal sized monkfish caught will decline.

4.2.2.4 Minimum fish size

This is Decision 6 in Appendix I. The Councils considered four alternatives for minimum fish size, including the no action alternative. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch. One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS.

4.2.2.4.1 Minimum fish size Alternative 1 (no action)

The current regulations apply different minimum sizes in the NFMA and SFMA, as follows:

NFMA: 11 inches (tail) or 17 inches (whole)

SFMA: 14 inches (tail) or 21 inches (whole)

4.2.2.4.2 Minimum fish size Alternative 2 (uniform size in both areas – 10 inches)

The Councils considered two minimum fish size options that would apply in both areas, and propose a uniform 11-inch tail size. This alternative, (Option 2, Alternative 2, Decision 6 in Appendix I) would have reduced the minimum size to 10 inches (tail), 15 inches (whole) in both areas.

4.2.2.4.3 Minimum fish size Alternative 3 (no minimum size)

Under this alternative, the minimum size would be eliminated.

4.2.2.4.4 Minimum fish size Alternative 4 (different size on monkfish-only DAS)

The Councils were considering this alternative if they adopted the DAS option that separates monkfish DAS from multispecies and scallop DAS usage requirements (under Decision 1 in Appendix I), and it would apply on monkfish-only DAS. Under this option, vessels fishing on a monkfish-only DAS, using large mesh as described Section 4.2.2.3, would have a uniform (in both areas) minimum size of 14 inches (tail), 21 inches (whole). This is the status quo minimum size in the SFMA and an increase from 11 inches (tail) in the NFMA.

Discussion/Rationale: The Councils considered reducing or eliminating the monkfish minimum size limit to reduce regulatory discards and improve monkfish commercial catch-at-age data. Minimum fish size regulations have been widely used in FMPs on the basis that they discourage the targeting of small fish, and increase yield per recruit (if successfully linked to gear requirements that have the appropriate size selectivity characteristics). On the other hand, a minimum size rule increases discards (because gear selectivity is not precise, or "knife-edged"), and results in incomplete commercial catch-at-age data because the landings data do not include the portion of the catch that is discarded. The Monkfish PDT agreed that, in general, there are more negative aspects to having a monkfish minimum size rule than not. Furthermore, the PDT noted that a significant portion of monkfish is caught incidentally in fisheries using gear that is not as size-selective as that required of the directed fishery, which diminishes the benefits of a minimum fish size in the directed fishery. As long as small-mesh and even 6-inch mesh fisheries catch monkfish, then a minimum size regulation will cause discarding of sub-legal sized monkfish. The PDT recognized, however, that in the absence of minimum size limits, other measures are needed to prevent targeting of small monkfish. The PDT suggested that gear strategies and/or other measures (targeted area closures) may be better approaches to delaying age at first capture (increasing yield per recruit) but their effectiveness depends on widespread support of fishermen and the willingness of fishermen to use gear solutions as intended.

The Councils have indicated that their preference for a uniform minimum fish size is based primarily on improving enforcement, and it will result in some reduction in discards, since the minimum size is being reduced in the southern area. Furthermore, the retaining a minimum size reaffirms the original basis for the minimum size rule, that is, to discourage targeting of small fish and increasing yield per recruit. The Advisory Panel was split between recommending no action and adopting a uniform 11-inch minimum size (the Councils' proposed action). Those supporting no action did not want to see a lower minimum size in the southern area than what is currently in place. The advisors generally opposed eliminating the minimum size because they did not want to create any incentive to target small monkfish, and this was also reflected by Council member comments.

4.2.2.5 Closed season or time out of the fishery

This is Decision 7 in Appendix I. The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) and propose Alternative 2, eliminating the closed season requirement.

4.2.2.5.1 Closed season Alternative 1 (no action)

Multispecies vessels (Monkfish Category C and D) are currently required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.

4.2.2.5.2 Closed season Alternative 3

Under this alternative, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations.

4.2.2.5.3 Closed season requirement under separated DAS

If DAS were separated, all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (20-day block) or Alternative 3 (2 20-day blocks).

Discussion/Rationale: The PDT reviewed the current regulations requiring vessels to take 20-day blocks out of the fishery during the spring and agreed that there is no apparent biological benefit from a 20-day-out requirement. Under the current 20-day block out of a 90 day period, a vessel still has 70 calendar days during which it could use most or all of its 40 monkfish DAS. Scallop/monkfish vessels are not subject to this requirement. As long as other fishing can occur, the benefits to spawning will not be realized, even if they cannot be measured or predicted. The PDT recommended that if the Councils want to retain a time-out requirement to protect a spring monkfish migration or spawning activity, the amount of required time out should be increased significantly, and it should be applied at the same time for all monkfish vessels. (Currently the start and end dates are different for monkfish-only and multispecies-monkfish vessels.) The Councils rejected the extended spawning closure alternative because its efficacy cannot be demonstrated, and because vessels fishing under the incidental limits would still be landing monkfish during this period.

4.2.2.6 Offshore SFMA Fishery

This is Decision 8 in Appendix I. The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but rejected options for the area covered under this program, and for the applicable trip limits and associated DAS that are discussed in this section.

4.2.2.6.1 Offshore SFMA Fishery Alternative 1 (no action)

Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas.

4.2.2.6.2 Offshore SFMA Fishery Alternative 2 (preferred alternative in the DSEIS)

As noted, under alternative the Councils considered, but rejected two options related to the area covered, and to the applicable trip limits and DAS.
Offshore Area Option 2: north of 38°00 and offshore of the loligo squid exemption line to its intersection with the northern boundary of the Monkfish/Skate trawl exemption area, 40°10'N, then eastward along the trawl exemption boundary, (Figure 5)
Offshore program DAS/trip limits Option 1: at the time of enrollment in the program, a vessel would select one of three choices, in addition to the standard trip limit/DAS applicable to all vessels. The choices are based on a ratio of 1:2, 1:3, or 1:4. Ratio is standard to program trip limit, so, for example, if the standard trip limit is 1,000 lbs./DAS, a 1:2 choice would allow the vessel to land up to 2,000 lbs./DAS on up to 1/2 the standard DAS allocation.

Discussion/Rationale: The proposed action addresses the problem created by implementation of the FMP without the "running clock". The Councils' original FMP proposal, disapproved by NMFS, would have allowed vessels to run their DAS clock upon returning to port to account for any trip limit overages. Without the running clock, offshore vessel owners have stated they can no longer profitably fish for monkfish under the restrictive trip limits while also consuming a multispecies DAS. The running clock would have allowed vessels to exceed the per-day trip limit and remain at the dock with the DAS clock running to account for the overage.

The Councils rejected Area Option 2 because of public comment supporting the proposed option that uses the squid exemption line as the northern boundary. Option 2 would eliminate much of the monkfish fishery on the southern flank of Georges Bank (Figure 5). The Councils rejected Trip limit/DAS Option 1, with the variable DAS allocation based on each vessel's selected trip limit ratio, because the proposal was overly complicated, and because public comment supported a 1,600 lb. trip limit with the potential for increased DAS (depending on the trip limits allocated to the regular fishery).

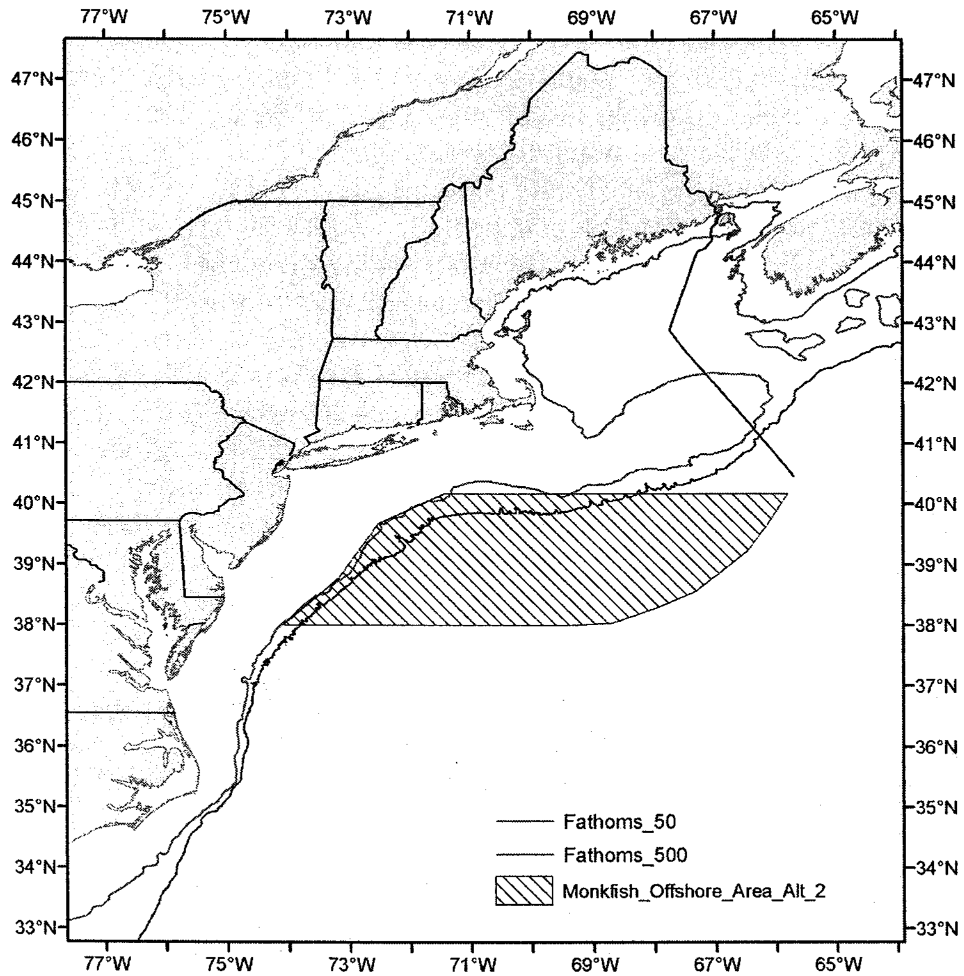


Figure 5 Offshore Area Alternative 2 –
Alternative 2, considered but rejected, would follow the Illex Exemption Area boundary from 38°N to the northern boundary of the Southern New England Monkfish Trawl Exemption Area (at 40°10'N), and then due east to the intersection with the EEZ boundary.

4.2.2.7 Modification of permit qualification for south of 38°N

This is Decision 9 in Appendix I. The Councils took to public hearings four alternatives that would revise the limited entry qualification periods for certain vessels that did not qualify for a permit under the original FMP, plus no action. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°N.

Vessels that qualify for a permit under one of these alternatives would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38° N, pending any change to the sea turtle protection closures that would provide fishing opportunity in that area. If the current sea turtle protection measures are not modified prior to the effectiveness of any revised permit qualification alternative under consideration in this section, then the northern boundary of the area accessible to vessels qualifying under this action would be set at 38°20'N when the Councils submit the final amendment document.

	Qualification period – four years prior to:	
Alternative 1	June 15, 1998	(full year)
Alternative 2	June 15, 1997	(full year)
<u>Alternative 3</u>	June 15, 1998	(March 15 – June 15)
Alternative 4	June 15, 1997	(March 15 – June 15)
Alternative 5 (no action)	February 27, 1995	

Table 15 Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

Discussion/Rationale: As noted in the discussion of the proposed action in Section 4.1.5, during the course of development of the Monkfish FMP, a fishery for monkfish developed south of the border separating Virginia and North Carolina. A small number of North Carolina and Virginia vessels began participating in this fishery shortly after publication of the monkfish limited access permit control date (February 27, 1995). The monkfish season in this area runs from mid-March to June. These southern vessels did not possess other federal northeast fishery permits and, therefore, did not receive timely notices and other information about limited access proposals contained in the Monkfish FMP. In addition, the southern boundary of the fishery management unit initially proposed for monkfish was the border separating Virginia and North Carolina. Although this southern boundary was twice modified (the final boundary was extended southward to the North Carolina and South Carolina border) before public hearings, the Monkfish FMP public hearing document described the management unit, and hence the limited access proposal, as terminating at the Virginia and North Carolina border. The Councils tacitly rejected the no action and other alternatives by virtue of having adopted one of the action alternatives, based on a review of the analysis and public comment supporting Alternative 3.

4.2.2.8 NAFO Regulated Area exemption program – no action

This is Alternative 2, Decision 10 in Appendix I. Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if the monkfish are caught outside of the EEZ.

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

4.2.2.9 Measures to minimize fishery impact on EFH

This is Decision 11 in Appendix I.

4.2.2.9.1 EFH Alternative 1 (No Action, which now includes EFH Alternative 3)

This option is the baseline EFH alternative, that is, the measures that would be in effect if the Councils take no action on measures proposed in this Amendment. Both Amendment 10 and Amendment 13 have been approved since the Councils completed development and analysis of this no-action alternative in the DEIS; therefore, this alternative includes measures implemented by Amendment 13 and Amendment 10 (EFH Alternative #3).

Table 16 evaluates the habitat impacts of the No Action alternative in this Amendment for each type of management measure. Overall, if no action is taken in this Amendment, the impacts on EFH will be neutral, relateive to the status quo. Figure 6 displays the year-round closed areas, both habitat and mortality closures, that are in effect under the No Action alterantive.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Closed season or time out of the fishery	Monkfish	Multispecies vessels (Monkfish Category C and D) are required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Authorized fishery programs	Monkfish	1. Offshore SFMA Fishery - Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas. 2. Permit qualification criteria may be revised with the effect of increasing the number of permits by 3-7. Vessels permitted under this program would be restricted to fishing south of 38°N.	1. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries. 2. Under no action, vessels are not permitted to fish in the EEZ and are, therefore, restricted to fishing in state waters. While this concentration of effort in nearshore areas could have negative habitat consequences if the vessels used mobile gear, but they currently only fish with gillnets, and are likely to continue doing so in the future, with no significant habitat effect.	**0**
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. Addition of Cashes as a year round closure	Year-round closures provide habitat benefits to the areas within the closures. The addition of Cashes Ledge as a year-round closure will benefit EFH. Rare kelp beds are found in that area.	**+**
Habitat Closed Areas	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	**+**
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravelly sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected scenarios (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	**+**

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
EFFORT REDUCTION MEASURES				
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Monkfish	Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously	This alternative relies on the scallop and multispecies management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	+
Trip limits for incidental catch	Monkfish	1. 50 lbs. (tails) per trip. 2. General category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish. 3. The area east of 74°00' is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30' and east of 74°00 went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip	1. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the small mesh multispecies, multispecies, fluke and other, exempted, fisheries. 2. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the general category scallop and surf clam/ocean quahog fisheries. 3. This measure may reduce allowable landings for large mesh multispecies vessels fishing between 72°30' and 74°00', but is not likely to alter the duration or intensity of fishing effort beyond that already experienced as a result of the large mesh multispecies fishery.	0
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	Mix of adaptive and phased effort reduction strategies. A days (60% of effective effort) B days (40% of effective effort) C days (FY01 allocation). Provides opportunity to fish on stocks that do not need rebuilding.	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this provision cannot be sold.	+
		GEAR MODIFICATION MEASURES		
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	+
Minimum fish size	Monkfish	The current regulations apply different minimum sizes in the NFMA and SFMA, as follows: **NFMA:** 11 inches (tail) or 17 inches (whole) **SFMA:** 14 inches (tail) or 21 inches (whole)	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
NFMA Monkfish trawl experimental fishery	Monkfish	No monkfish trawl exempted fishery in the NFMA	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch rates and increase bottom time in areas where medium-small sized scallops are prevalent.	+
Ten inch twine tops	Scallop	As of May 1, 2004, all scallop dredges with limited access or general category permits are required to have twine tops with no less than 10inches.	Ten-inch twine tops will reduce by-catch, no direct habitat effects.	0
		OTHER MEASURES		
Exemption program for vessels fishing outside of	Monkfish	Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
the EEZ (in the NAFO Regulated Area)		the monkfish are caught outside of the EEZ.		
Clarification of vessel baseline history	Monkfish	Vessels that had another federal fishery permit and upgraded or downsized length, horsepower or tonnage prior to getting a monkfish permit have two different upgrading baselines.	It is unclear how this measure could impact EFH. While the potential exists for increasing effective effort on the monkfish fishery, particularly where a large discrepancy exists between baselines and the more restrictive baseline permit is dropped, there is no evidence that this increase in effective effort may translate into an increase in adverse impacts on EFH from fishing activities.	**Uncertain**
Change fishing year	Monkfish	The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	**+**
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	**+**

Table 16 - Description of Status Quo measures that impact EFH that would be in effect under the EFH No Action Alternative (#1)

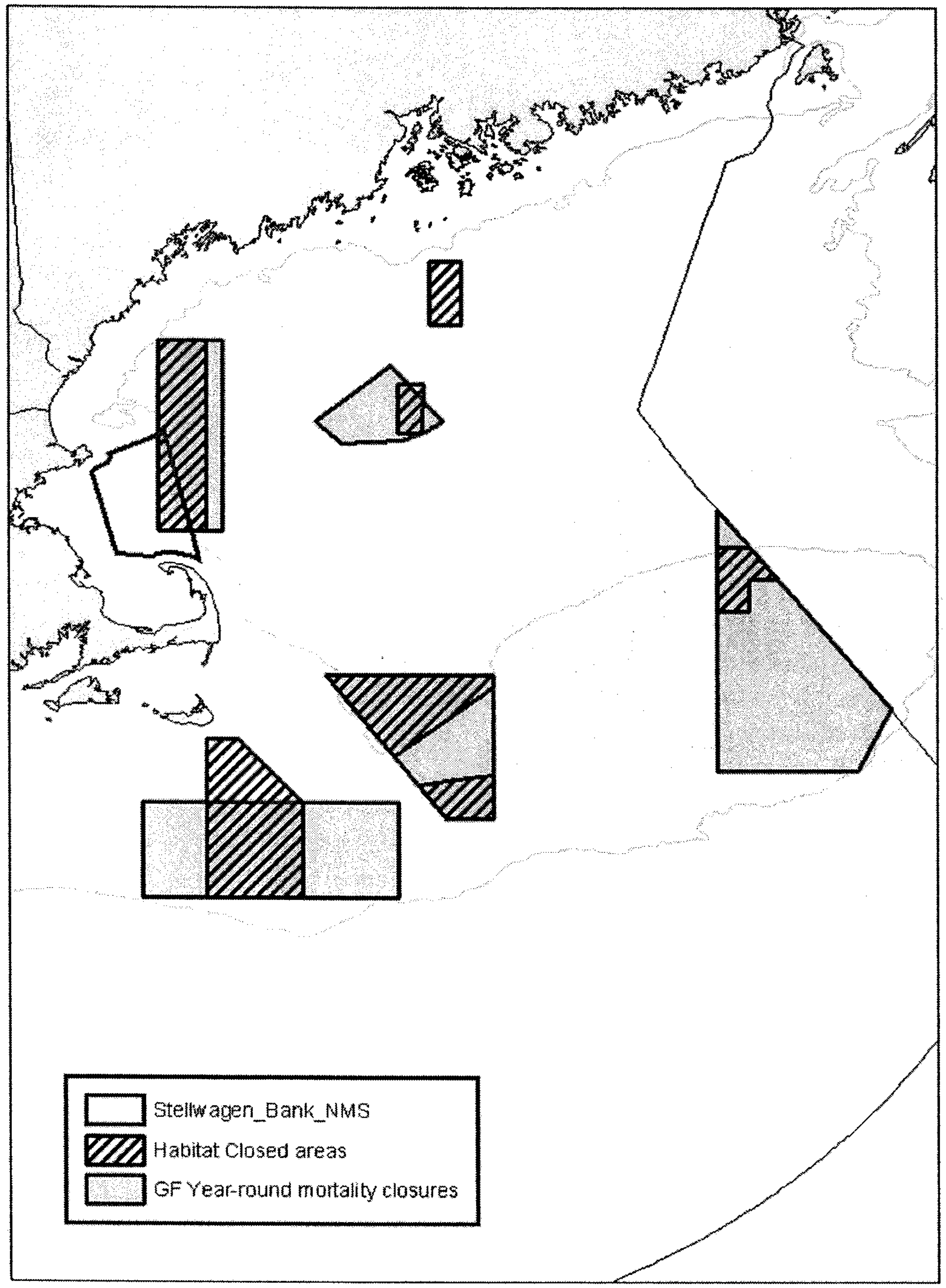


Figure 6 – Habitat closed areas implemented under the Multispecies and Scallop plans (dashed lines) overlapped with the year-round groundfish mortality closed areas.

4.2.2.9.2 EFH Alternaitve 2 (Benefits of other measures considered in Amendment 2)

This alternative was designed to identify the non-habitat specific measures selected in Amendment 2 that would have potential benefits to EFH, in addition to the measures already defined as part of the No action. Of all the non-habitat specific measures under consideration in this Amendment, only a handful of measures were expected to have beneficial impacts on EFH if selected (Table 17). Once the Councils selected final measures for this Amendment, none of the non-habitat specific measures with habitat benefits were part of the proposed action. Therefore, this alternative is not considered part of the proposed action to minimize the impacts of this fishery on EFH, since none of these measures are being recommended under this Amendment. There are numerous other non-habitat specific measures under the Monkfsih plan that have potential benefits to habitat, and they are described in Section 4.2.2.9.1.

Alternative	Feature	Habitat Benefits
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Scallop and multispecies limited access vessels could fish under monkfish only DAS under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS.	Without the associated trawl gear requirement, separated DAS would allow for increased overall effort with no habitat benefit. However, if the proposed trawl gear configuration is adopted as part of the separated DAS alternative, separating DAS may actually reduce impacts to vulnerable EFH for several reasons.
Minimum mesh size on directed MF DAS	Increase the codend mesh from 10-inch square or 12-inch diamond mesh to 12-inch square mesh.	• Expected to improve bottom habitat conditions iby reducing bycatch and mortality of benthic organisms. May reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species in areas where directed trawling for monkfish occurs.
NFMA Monkfish trawl experimental fishery		Potential for a positive impact on EFH if the gear tested is shown to reduce adverse effects on EFH.

Table 17 Potential habitat benefits of non-habitat Amendment 2 management alternatives

* Note: none of these measures under consideration were selected as part of the proposed action.

4.2.2.9.3 EFH Alternative 4 (Monkfish trawl configuration)

The Councils considered an alternative trawl configurations specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated.

4.2.2.9.3.1 Option 2 (Preferred Alternative in DSEIS)

The Councils considered requiring specific trawl gear when a vessel is on a monkfish DAS (not a combined DAS), if DAS were decoupled. The Councils considered adopting individual elements from the following options, and sought public comment on the specific components. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and reduce the likelihood that they will be used in hard bottom areas that provide EFH for other Groundfish species (see rationale below).

1. Max disc diameter on sweep
Option A: 12-inches in the northern and southern management areas
Option B: 6-inches in the southern management area only
Option C: 16-inches in northern area only, configured so discs can roll (with only one wire or chain)
2.Maximum ratio of headrope length to footrope length of 1:1.1 to eliminate overhang
3. No ground cable, <u>or</u> maximum distance between doors and wings cannot be greater than ½ the length of the vessel
4. Upper and lower legs (cables that attach the net wings to the doors) must be of equal length
5. Minimum mesh size
Option A: (no action) 10" square or 12" diamond. (codend only), Multispecies mesh in the body of the net
Option B: 10" square or 12" diamond. (entire net)
Option C: 12" square (codend), 12" diamond (body and wings)
Option D: 12" square (codend only), Multispecies mesh in the body

6. Two-seam net construction requirement

Discussion/Rationale: These trawl gear proposals were developed during a cooperative workshop held by the Monkfish PDT involving trawl industry members and gear technology experts. Initial discussion in the workshop focused on the relationship between monkfish behavior and the configuration of trawls. Observations of monkfish behavior in the vicinity of a trawl show that herding is not a factor, minimizing the need for the gear to create a dust cloud, but increasing the importance of the wings of the net, which are often extended on monkfish trawls. Further, monkfish do not attempt to escape upwards, as do roundfish, allowing for a lower headrope than is needed on a groundfish trawl.

Participants agreed that the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. While in the southern area the bottom characteristics are more uniform over large areas, in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud.

Furthermore, since most vessels are required to use a multispecies DAS while fishing for monkfish, they currently fish in areas where they can target both groundfish and monkfish. But industry members suggested that, under de-coupled monkfish DAS, a directed, monkfish-only trawl fishery could occur if vessels fished solely on muddy bottoms. If retention of groundfish were prohibited, vessels would have no incentive to fish on the more complex bottom types where those species would be caught in combination with monkfish.

Through this discussion, participants agreed that the best strategy would be to develop a net that is efficient at catching monkfish (taking into account fish behavior and bottom types) while inefficient or incapable of fishing in more complex bottom areas where many groundfish species are found. Increased efficiency would reduce the time gear would be in contact with the bottom for a given trip limit. By removing the incentive and ability to fish in hard bottom, the strategy would effectively eliminate the impact of the monkfish trawl fishery on essential fish habitat for many groundfish species that depend on those areas during most life history stages.

The Councils recognized that, while some fishermen may have worked with individual components of the proposed configuration, the complete net configuration has not been tested under commercial conditions. To that end, the Councils sought public comment on which individual components could be adopted under this amendment, and which need further testing before being required on directed monkfish trawls. Public comment, and the industry advisors, suggested that this net needs further testing before it is required on commercial vessels. Furthermore, since the Councils are not separating DAS usage requirements, one of the stated conditions of this alternative was not met.

4.2.2.9.4 EFH Alternative 5 (deep-sea canyon habitats)

The Councils considered two options to minimize the impacts of the directed monkfish fishery on deep-sea canyon habitats (Alternative 5AB and Alternative 5C). Alternative 5AB is part of the proposed action, and Alternative 5C was rejected.

4.2.2.9.4.1 EFH Alternative 5C (up to 12 large, steep-walled canyon closures) (Preferred alternative in DSEIS)

This option proposed to close waters above up to 12 large canyons, based on the premise that many deep-sea corals need hard substrate and are predominately found on hard substrate within canyons, not on the slope. Although research has not been conducted in every large canyon in the region, the canyons with hard substrate and steep walls are likely to have corals, since other canyons with similar characteristics do (Figure 7 and Table 18). The Council chose Alternative 5AB to reduce the potential impacts of the fishery on deep-sea canyons with *known* coral habitats. The primary justification for selecting Alternative 5AB over Alterantive 5C is that there is considerable research from the two canyon areas in Alternative 5AB, but not all twelve. Until more data is available on other canyons in the region, the Councils support closing the waters above the two canyons to protect the deep-sea ecosystems in those areas. The Councils considered closing the areas to trawl gear only (Option 1) or all gears (Option 2) on a monkfish DAS.

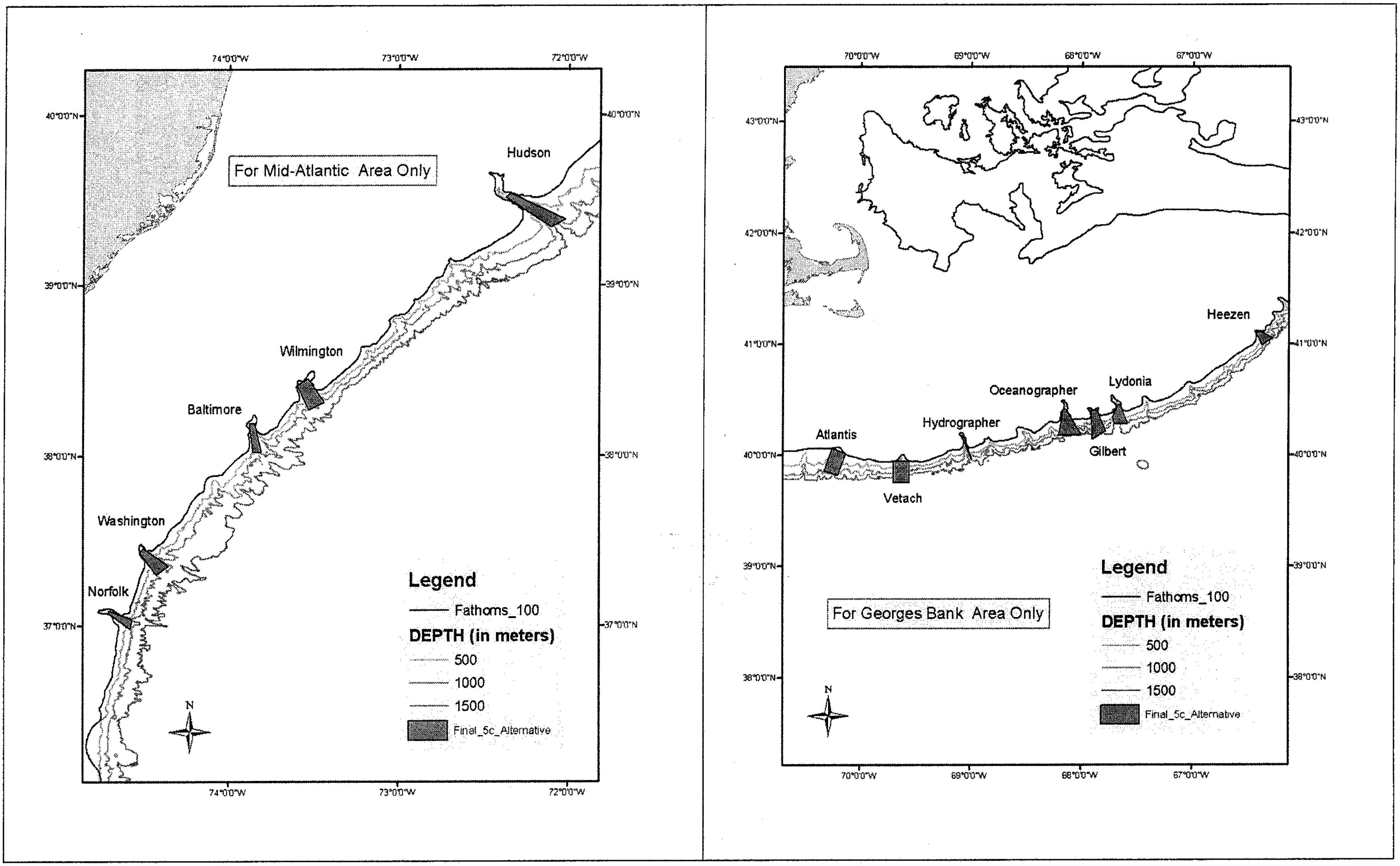


Figure 7 – Habitat Alternative 5 C –
Note that two maps are provided so the areas can be seen more clearly, but this alternative contains areas in all 12 deep-water canyons

	Latitude		Longitude	
Norfolk	36	58	74	34
	37	4	74	41
	37	5	74	41
	37	2	74	33
Washington	37	17	74	25
	37	25	74	30
	37	27	74	29
	37	21	74	20
Baltimore	38	1	73	51
	38	11	73	52
	38	11	73	50
	38	0	73	48
Wilmington	38	16	73	31
	38	24	73	35
	38	27	73	31
	38	18	73	26
Hudson	39	20	72	6
	39	31	72	22
	39	32	72	20
	39	23	72	1
Atlantis	39	51	70	19
	40	3	70	14
	40	0	70	7
	39	49	70	12

	Latitude		Longitude	
Veatch	39	45	69	41
	39	56	69	41
	39	56	69	32
	39	45	69	32
Hydrographer	39	57	68	59
	40	10	69	4
	40	10	69	3
	39	57	68	58
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Gilbert	40	8	67	53
	40	23	67	54
	40	24	67	51
	40	13	67	46
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
	40	27	67	38
Heezen	40	59	66	22
	41	5	66	25
	41	6	66	23
	41	2	66	16

Table 18 – Coordinates for Habitat Alternative 5C

4.2.2.10 Cooperative research programs funding – no action

This is Alternative 3, Decision 12 in Appendix I. The Councils propose two alternatives in this amendment for facilitating and streamlining cooperative research programs under the FMP (Section 4.1.9), one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research.

Under Alternative 3, no action, vessels that want to participate in cooperative research must either submit an experimental fishery permit application and/or respond to a NMFS Request for Proposals. If a vessel submits an experimental fishery permit application it may have to also submit an Environmental Assessment (EA) to determine the impacts of the experiment on the environment, particularly if the vessel seeks an exemption from DAS usage requirements and intends to land the fish caught while participating in the cooperative research activity. The preparation and review of EA's are time consuming, and may discourage potential applicants from conducting such research as a result.

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

4.2.2.11 Clarification of vessel baseline history – no action

This is Alternative 1, Decision 13 in Appendix I. The Councils are proposing in this amendment to eliminate the dual vessel-upgrading baseline that exists on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (Section 4.1.10). Currently, Category C and D permits have two baselines, one associated with the multispecies or scallop limited access permit, and one associated with the monkfish permit that was issued several years later. If the permit had not been transferred, or the vessel had not been upgraded prior to issuing the monkfish permit, the baseline characteristics would be the same for both the monkfish and multispecies or scallop permit, and the same length, tonnage and horsepower upgrading restrictions apply. But if the vessel characteristics were different when the monkfish permit was issued (through upgrading or permit transfer), then there are now two baselines associated with individual permits. If a vessel owner now wanted to upgrade the vessel or transfer the permits to another vessel, the more restrictive baseline would govern the transaction, unless the owner relinquished the species permit with the more restrictive baseline.

For example, if a vessel's baseline length under the multispecies limited access permit is 60 feet, and that permit was transferred to a vessel 50 feet long prior to receiving the monkfish permit, the vessel would have dual baselines (60 ft. on the multispecies permit and 50 ft. on the monkfish permit). A current permit transfer would be restricted to a vessel 55 ft. or less (50 ft. plus the 10 percent upgrading restriction). On the other hand, if the owner relinquished the monkfish permit, the transfer of the multispecies permit could apply to a vessel up to 66 ft. (60 ft. plus 10 percent upgrading limit).

Discussion/Rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

4.2.2.12 NFMA Monkfish trawl experimental fishery

This is Alternative 2, Decision 14 in Appendix I. The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA. Currently, there is no monkfish trawl exempted fishery in the NFMA, although, a monkfish gillnet exempted fishery already exists. The Councils proposed establishing a trawl experimental fishery in the NFMA in this amendment to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS. The need for such an exempted fishery existed primarily if the Councils had decided to separate DAS usage requirements. If monkfish DAS were separated from multispecies DAS usage requirements, trawl vessels in the NFMA would not be able to target monkfish unless they also used a multispecies DAS, or they propose an experimental fishery through one of the procedures outlined in the alternatives in Section 4.1.9, including the no action alternative.

Under the non-preferred proposal, participants in the experimental fishery would operate under a Letter of Authorization (LOA) from the Regional Administrator, and would not have to obtain an Experimental Fisheries Permit. This experimental fishery would not be subject to the RFP or grants administrative process. Monkfish Category C and D vessels participating in the experimental fishery would be exempt from up to one percent of the total allocation of Monkfish DAS to C and D vessels (approximately 300 DAS total). This exemption would be subtracted from the research DAS exemption or set-aside outlined in Section 4.1.9.

Vessels participating in the experimental fishery under the LOA would be required to fish under their multispecies DAS but would be allowed to land their multispecies catch (as long as the vessel complies with other multispecies regulations, such as mesh size) as well as the monkfish catch (under the monkfish DAS exemption). Those vessels could seek an exemption from the multispecies DAS usage requirement by submitting an EFP request that would have to be made available for public comment. Under this approach, the monkfish DAS exemption provided for and analyzed in this amendment would still apply. Vessels would use any of the gear configurations and mesh sizes being considered in this amendment to evaluate their efficacy in minimizing bycatch of regulated multispecies, or any other configurations to determine the optimal trawl net that could be used in an exempted fishery. Gear could also be evaluated for its effectiveness in minimizing the impact of the trawl fishery on EFH of regulated species.

The trawl experimental fishery would take place in any of three areas shown in Figure 8 during the times outlined in the following tables:

Wilkinson Basin - October – April

North Lat.	West Long.
42°00'	70°00'
42°00'	69°00'
43°00'	69°00'
43°00'	70°00'

Franklin Basin – March – May, October – December

North Lat.	West Long.
41°40'	68°50'
42°00'	68°50'
42°00'	68°20'
42°05'	68°20'
42°20'	67°50'
42°10'	67°50'
41°40'	68°30'

Central/Inshore Gulf of Maine – October – January

North Lat.	West Long.
43°50'	68°30'
43°00'	68°30'
43°00'	69°30'
43°50'	69°30'

Table 19 Proposed area/seasons for NFMA trawl experimental fisheries

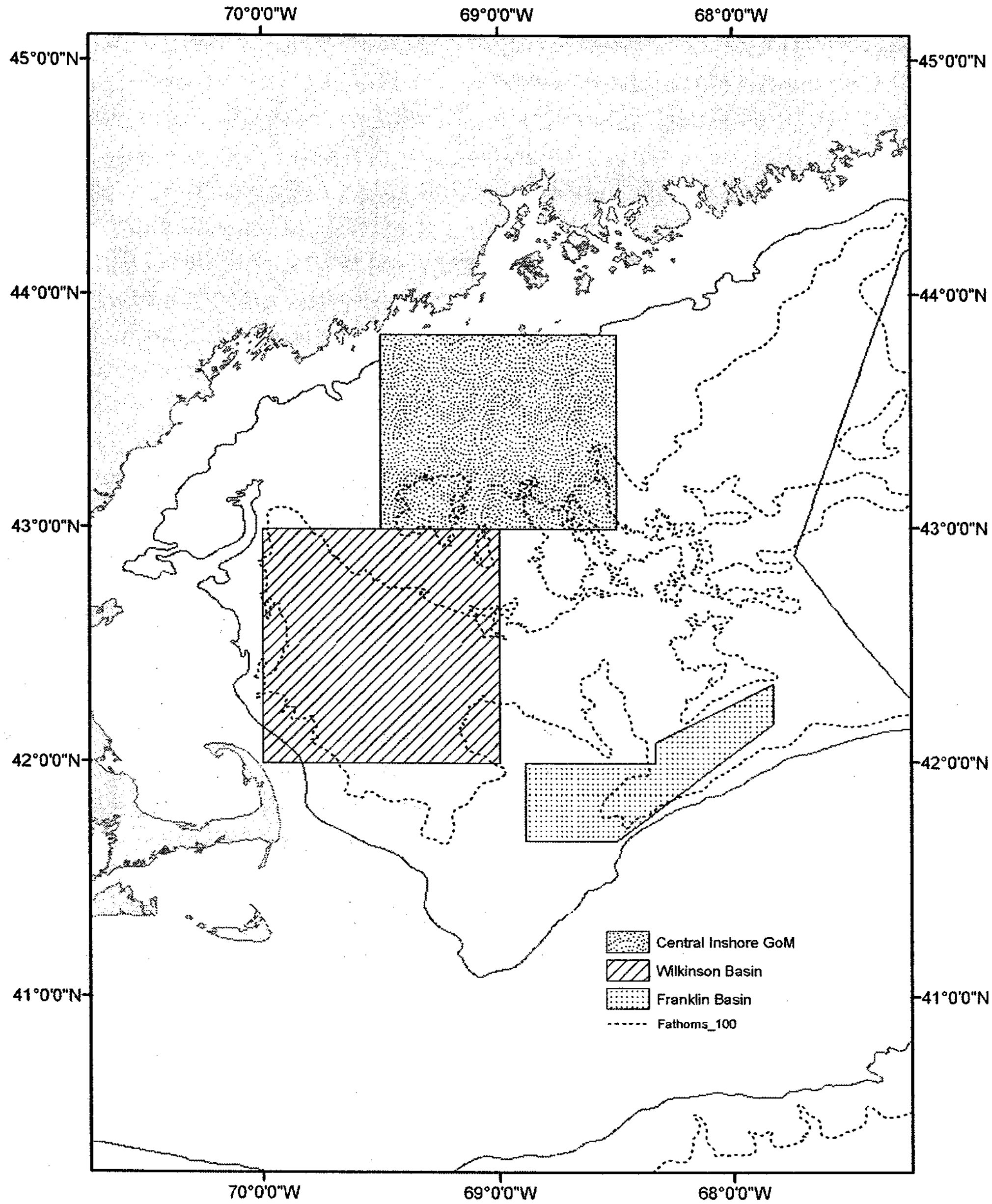


Figure 8 Proposed Gulf of Maine monkfish trawl experimental fishery areas.

Discussion/Rationale: The primary purpose of the experimental fishery is to determine if, and under what circumstances (gear, area, season) a monkfish trawl exempted fishery can be established under the multispecies regulations. Vessels and technical collaborators would submit proposals to NMFS along with the request for Letters of Authorization that would include number of participating vessels, DAS to be used, gear, area and season. Vessels seeking to participate in the experimental fishery would need to seek funding from outside sources to cover the cost of data collection and analysis, and any vessel and crew costs not covered by monkfish and/or multispecies landings. The experimental fishery will also be used to evaluate the efficacy of the monkfish trawl in reducing bycatch (compared to the nets currently being used) and in minimizing impacts of the fishery on essential fish habitat of other species. Researchers will submit their results to NMFS for consideration in establishing a trawl exempted fishery, and NMFS will consult with the Councils prior to implementing any exemptions.

The Councils rejected this proposal primarily for two reasons: since they are not de-coupling monkfish DAS usage requirements, the need to establish a trawl exempted fishery in the NFMA is greatly diminished; and, vessels can already conduct experimental fisheries through the existing procedures, and in fact, just such an experiment is taking place this year under the same area, gear and season parameters outlined in this proposal.

4.2.2.13 Change fishing year

This is Decision 15 in Appendix I. The NEFMC considered three alternatives for changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) proposed changing the monkfish fishing year in this amendment to be consistent with any changes under Amendment 13. The NEFMC has decided to retain the current multispecies fishing year, but the Councils still considered changing the monkfish fishing year in the Amendment 2 DSEIS based on public comment on the following alternatives specifically as they pertain to the monkfish management program. Changing the fishing year would require pro-rating of DAS allocations to account for partial years during the transition period, and three alternatives are under consideration.

The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP. The fishing year under the Sea Scallop FMP runs from March 1 through February, thus, vessels with monkfish Category C and D permits that also have limited access scallop permits operate under two different fishing years.

4.2.2.13.1 Fishing year – Alternative 2 (calendar year)

Under this alternative, the monkfish fishing year would be changed to a calendar year.

4.2.2.13.2 Fishing year – Alternative 3 (October- September)

This alternative would change the start of the fishing year to October 1.

4.2.2.13.3 Fishing year – Alternative 4 (July – June)

This alternative would change the start of the fishing year to July 1.

Discussion/Rationale: The Councils initially considered these alternatives to keep the monkfish fishing year on the same schedule as the multispecies fishing year, since more than half of all monkfish limited access vessels also have multispecies limited access permits. Even when it became clear that the multispecies fishing year would not be changed, the Councils retained these alternatives because they felt there are circumstances unique to the monkfish fishery that warrant consideration.

Discussion/Rationale: Based on the TAC and trip limit setting procedure established in Framework 2, a May 1 start date (no action alternative) results in the shortest possible gap between the availability of the NMFS bottom trawl survey indices (used to set the trip limits and TACs) and implementation of the management measures, while allowing sufficient time for the publication of a proposed rule. Traditionally, peak monkfish landings and prices occur from November through May, which aligns well with the management cycle of a calendar year.

Changing the fishing year to a calendar year (Alternative 2) would align the fishing year data with stock assessment data that are based on a calendar year. As long as the fishery management program is based on the autumn trawl survey, however, such an alignment is not as important in monkfish as it would be in stocks where the management measures are based on stock assessment results. Basing the management measures on a calendar year would result in a 13-month gap between the autumn survey and the effectiveness date of the associated management measures, compared to six months under the no action alternative. Since several other fisheries in the northeast region are already on a calendar year basis, changing the monkfish fishing year to a calendar year would add to the Councils' and NMFS' workload as these plans would be converging on the review and implementation process simultaneously, a problem that would be exacerbated if multispecies also changes to a calendar year.

Alternative 3 (October 1 start date) would result in management measures taking effect just before the start of the peak monkfish fishing period, while Alternative 4 (July 1) would take effect at the low point in the annual landings/price cycle. The gap between the autumn survey and the start of the fishing year would be 11 months and 9 months, for Alternatives 3 and 4, respectively.

The Councils determined that the current fishing year (no action alternative) is best suited to the circumstances of the fishery and management program, including the availability of current scientific data used to monitor the rebuilding program.

4.2.2.14 DAS prorating alternatives if the fishing year is changed

This is Decision 16 in Appendix I. Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The following two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment.

4.2.2.14.1 DAS prorating – Alternative 1

New DAS allocations would become effective at the start of the next fishing year after implementation of the Amendment (that is, May 1, 2005, if Amendment 2 is implemented in November 2004). If the fishing year is changed under Amendment 2, the period between May 1, 2005 and the start of the new fishing year is defined as a transition period. Under the Multispecies proposals, during this period, a vessel will be limited to its 2003 allocation, including any carry-over DAS allowed, times the number of months in the transition period, divided by 12. Any revised DAS allocations (either Individual DAS or a Fleet DAS allocation other than the current

40) would not take effect until the start of the 2005 fishing year. The base number of monkfish DAS for the prorating will be the Amendment 2 DAS allocation plus any carryover from the 2004 fishing year. (The number of months will be rounded up to the next whole value: three months and one day will be treated as four months.) A vessel can carry over up to ten DAS into the new, revised fishing year. The following formula is shown schematically in Table 20 for the four fishing year alternatives (including no action).

Transition period DAS = (Number of months/12) X (Amendment 2 DAS)

For example, if the Councils select the calendar year (Jan. – Dec.) alternative, and a vessel has 40 DAS under Amendment 2, the vessel would have 9/12ths (for May through December) of 40 DAS, or 30 DAS, to use between May and December, 2005, and 40 DAS for the calendar year starting January 1, 2006.

4.2.2.14.2 DAS prorating – Alternative 2

Under this alternative, the transition period would extend from the time the Amendment 2 DAS allocations take effect (that is, May 1, 2005, if Amendment 2 is implemented in November 2004) through the next full fishing year (12 months from the start of the revised fishing year start date). A vessel would be limited to its new allocation times the number of months in the transition period, divided by 12, plus the new allocation. So, for example, if Amendment 2 is implemented in November 2004, any new DAS allocations would become effective May 1, 2005. If the new fishing year starts in October, the vessel would be allocated 5/12 of its DAS (for the May-October period) plus a full year's DAS allocation, which it could use between May 1, 2005 and September 30, 2006 (plus any carryover from the 2004 fishing year). A vessel can carry over up to ten DAS into the new, revised fishing year. The following formula is shown schematically in Table 21 for the four fishing year alternatives (including no action).

Transition period DAS= [(Number of months from May 1 to new fishing year start date/12) X (Amendment 2 allocation)] + Amendment 2 allocation

With

Transition period running from May 1, 2005 through first full revised fishing year

Under this alternative, using the same example as in the previous one, the vessel would have 70 DAS to use between May, 2005 and December 31, 2006, and 40 DAS for the calendar year starting January1, 2007.

Discussion/Rationale: These alternatives were designed to facilitate a transition from the current fishing year (May-April) to one of three alternative proposals through a pro-ration of DAS for any partial year. Since the Councils are not changing the fishing year, these alternatives are no longer relevant.

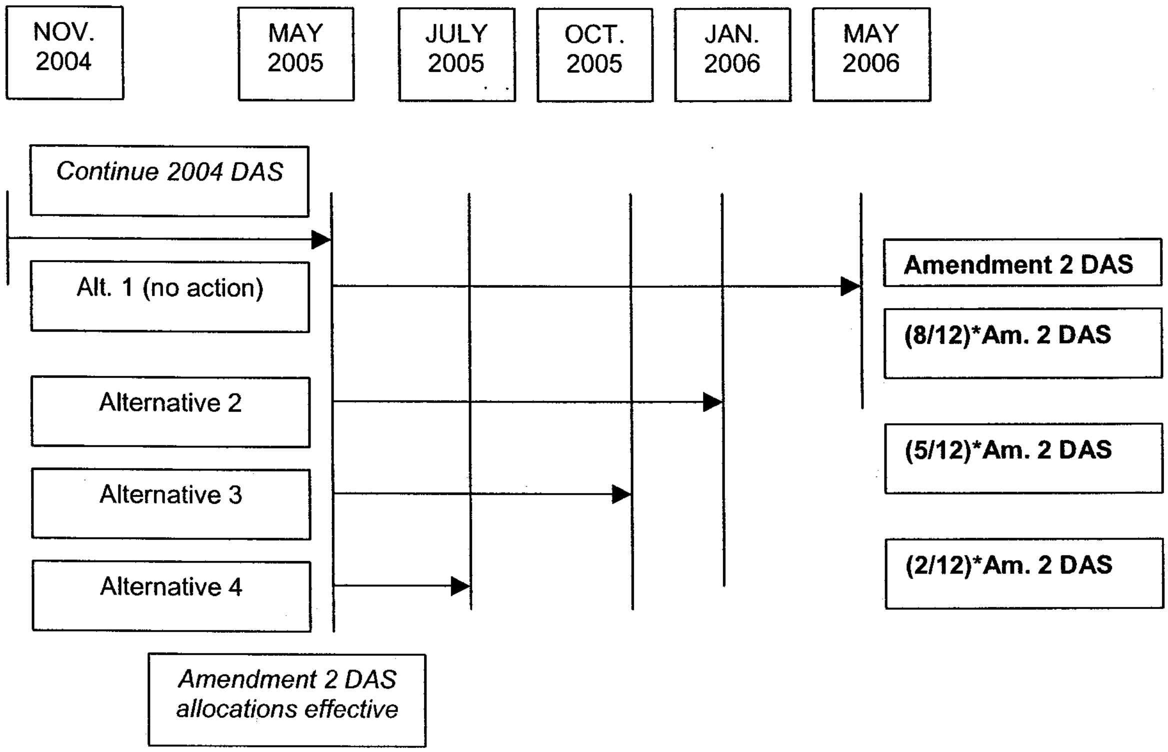


Table 20 DAS prorating Alternative 1 schematic diagram

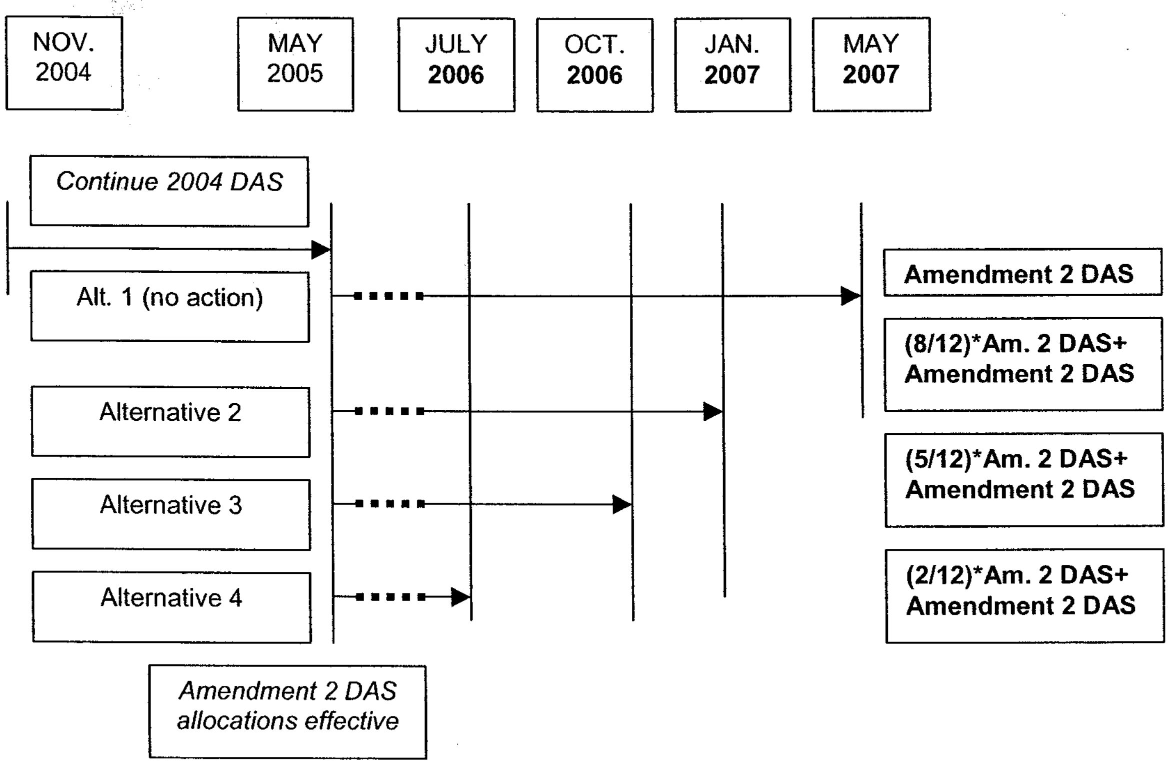


Table 21 DAS prorating Alternative 2 schematic diagram

4.2.2.15 Modifications to the framework adjustment process

The Councils are proposing to include three types of actions to the current list of actions that can be taken under the framework adjustment process (see Section 4.1.6). These are:

- Implement transferable monkfish DAS
- Implement measures to minimize fishery impact on protected species, and
- Implement requirements to use bycatch reduction devices.

When considering each of these items on the DSEIS, the Councils also considered the no-action alternative, see Decision 1c and Decision 7, Appendix I.

Discussion/rationale: The Councils tacitly rejected the no action alternatives by virtue of having adopted one of the action alternatives, for the reasons described in Section 4.1.

5.0 AFFECTED ENVIRONMENT

5.1 Biological Environment of the Fishery

5.1.1 Monkfish Life History and habitat requirements

This section contains a description of the biological environment of the monkfish fishery, including biological habitat conditions in the Gulf of Maine, Georges Bank, southern New England and Mid-Atlantic regions. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a). For more information on monkfish life history, habitat characteristics and geographical distribution see Steimle et al., 1998). For more information on biological characteristics of monkfish see Bigelow and Schroeder (1953) and Caruso (2002).

Fish pass through a series of stages and conditions throughout their life histories. The probability of successfully surviving and reproducing subsequent generations varies from species to species and for individuals of a species. One of the main values of habitat lies in the provision of adequate food for all metabolic considerations of fish, ultimately for both individual and population growth. Habitat can also provide refugia from predation, aggregation of prey for more effective feeding (i.e., minimized foraging costs), aggregation of individuals to enhance spawning, shelter from extreme physio-chemical events, adequate physio-chemical environment (e.g., oxygen production, detritus conversion, etc.), cycling of nutrients into "packaged" forms amenable for propagation up through the food web, etc. Thus, available habitat can improve the probabilities of successful survival and reproduction of fish.

Additionally, the degree of habitat complexity and utilization can mitigate some of the effects of predatory losses of fishes, particularly for juvenile stages. However, competition is another major biological consideration facing fish that is difficult to directly demonstrate in marine ecosystems. Knowing patterns of shared prey use (e.g., diet similarities) and spatio-temporal overlap can provide some insight into the potential competitors of a given fish species. Other biotic concerns such as parasitism, commensalism, or mutualism are recognized as factors but cannot be assessed effectively on the broad oceanographic and fish community scales at which fish are typically sampled.

Monkfish is widely distributed throughout the northeast region as shown in the four summary maps of monkfish caught during NMFS bottom trawl surveys (Figure 9).

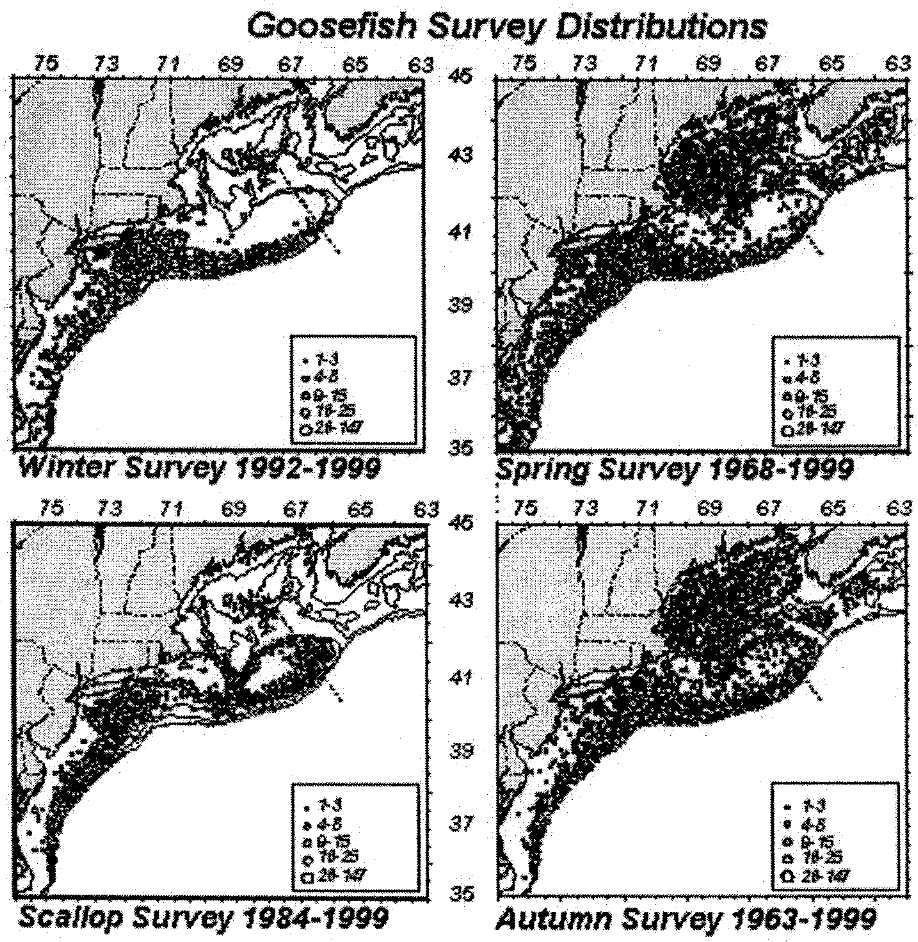


Figure 9 Monkfish distribution on four NMFS bottom trawl surveys (entire time series). The scallop survey is conducted during the summer.

The 2001 cooperative monkfish survey covered deeper waters than the NMFS surveys, but only shows the distribution at the time of the survey.

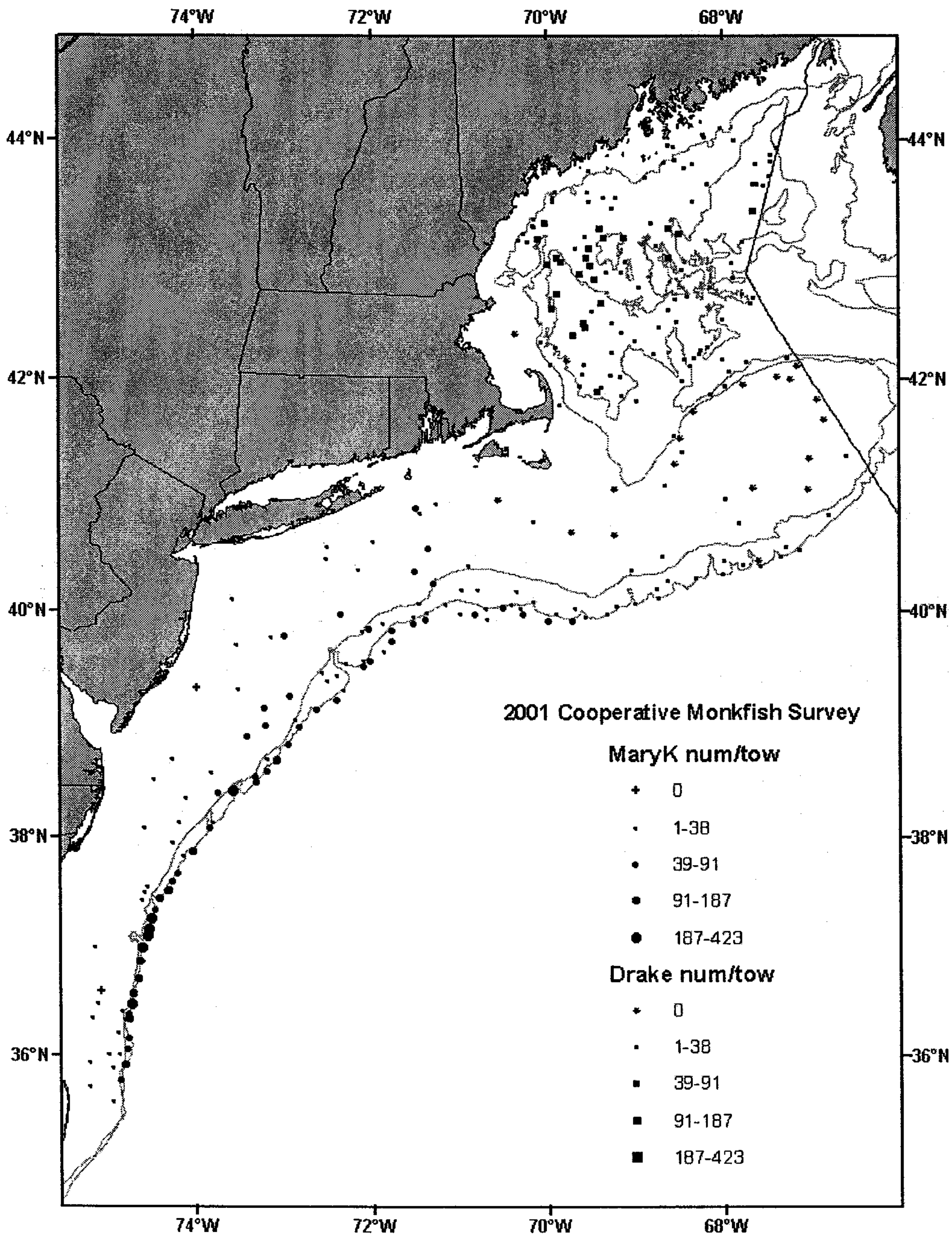


Figure 10 Distribution of monkfish catches (number per tow) during the Spring 2001 cooperative monkfish survey.

Below is a compilation of the general biological setting or "environment" within which monkfish are found. This mosaic of information is not intended to provide conclusive specific details regarding ecological processes that affect a particular fish species or life stage, rather a general background of the biological community surrounding these fish.

5.1.2 Stock Status

Framework 2, implemented May 2003, incorporated revised overfishing definition reference points and status determination criteria. Biomass reference points and status determination continues to be based on the NMFS autumn bottom trawl survey (three-year running average), although the minimum biomass threshold was revised to equate to 1/2 the biomass target. The fishing mortality threshold reference point was revised to Fmax. Both stocks have increased since 1999 when the FMP was implemented. At that time the northern and southern stock 3-year average biomass indices were 0.82 and 0.47 kg./tow, respectively. Framework 2 implemented a biomass rebuilding program based on achieving annual incremental biomass targets and revised the minimum biomass threshold.

The status of the stocks with respect to fishing mortality reference points is unknown, since there are no estimates of current fishing mortality. The following table shows the status of the stocks with respect to the biomass targets (annual and overall) and threshold:

kg/tow	2000	2001	2002	2003	2003 3-yr. Ave.	2003 target	Bthreshold	Btarget
NFMA	2.495	2.052	2.103	1.925	2.030	1.49	1.25	2.5
SFMA	0.477	0.708	1.253	0.828	0.930	1.02	0.93	1.85

Table 22 Monkfish biomass stock status through 2003.

The stock status, through the fall 2003 NMFS bottom trawl survey, relative to the annual and overall biomass reference points are shown in Figure 11 and Figure 12, for the northern and southern stocks, respectively. Based on the current reference points and estimates of stock status, the Monkfish Monitoring Committee concluded that both stocks are no longer overfished, but, while the northern stock is ahead of the annual rebuilding targets, the southern stock is still lagging behind the rebuilding schedule.

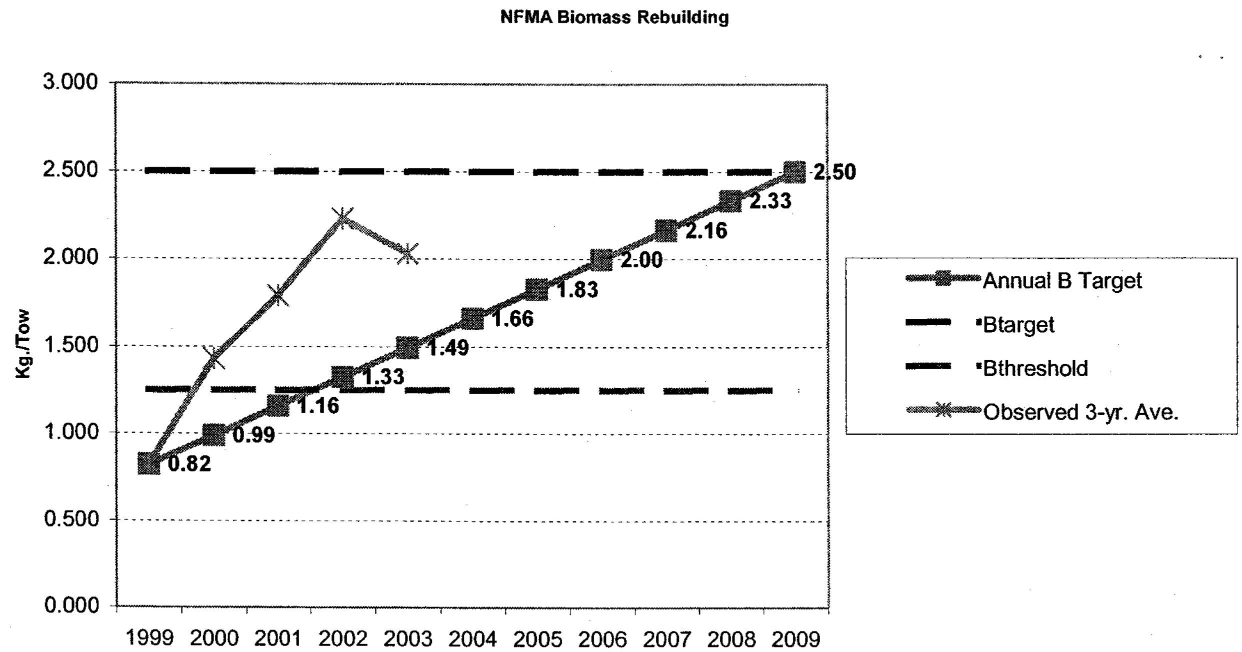


Figure 11 NFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Framework 2.

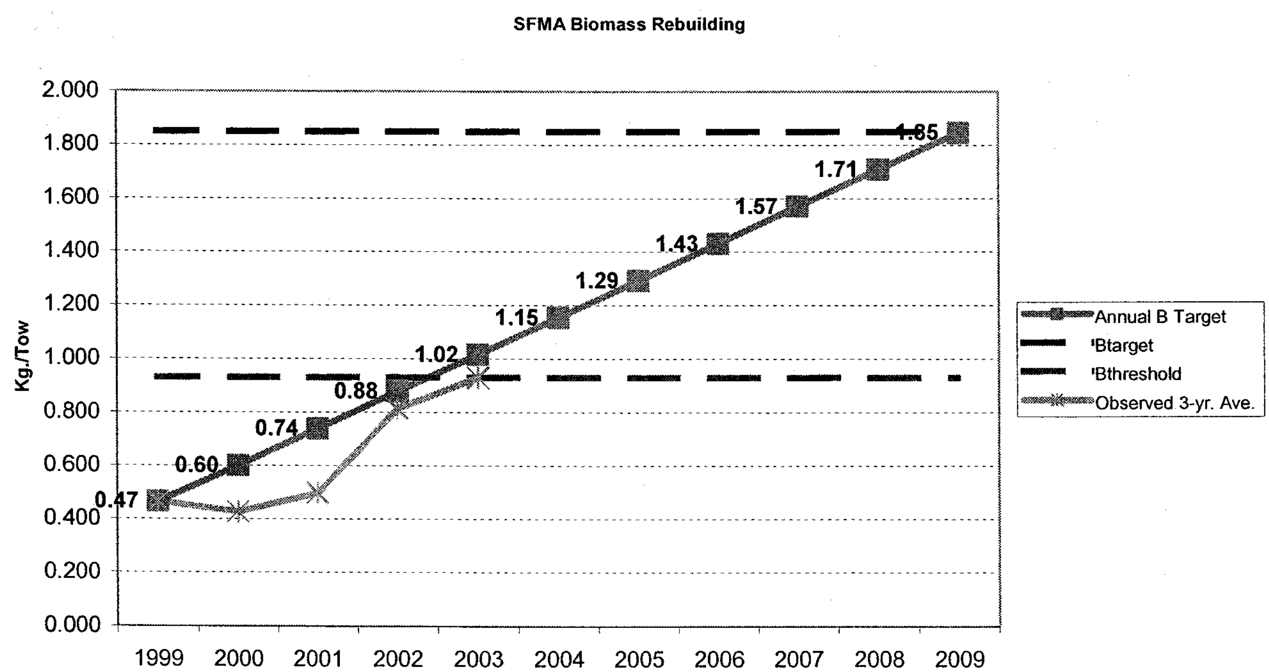


Figure 12– SFMA monkfish stock status through 2003 relative to the index-based method for biomass rebuilding adopted in Framework 2.

The assumed natural mortality rate for monkfish adopted by the Stock Assessment Review Committee is M=0.2, based on an expected maximum age of 15-20 years given previous studies of age and growth. The maximum fishing mortality threshold adopted in Framework 2 is F=Fmax, which is currently estimated to be F=0.2. Estimates of current fishing mortality are not available, so the status of the stock with respect to the "overfishing" definition reference point is unknown.

5.1.3 Habitat Associations and Functions

From a biological perspective, habitats provide living things with the basic life requirements of nourishment and shelter. Habitats may also provide a broader range of benefits to the ecosystem. An illustration of the broader context is the way seagrasses physically stabilize the substrate and help recirculate oxygen and nutrients. In this general discussion, we will focus on the primary, direct value of habitats to federally managed species—feeding and shelter from predation.

The spatial and temporal variation of prey abundance influences the survivorship, recruitment, development, and spatial distribution of organisms at every trophic level. For example, phytoplankton abundance and distribution are a great influence on ichthyoplankton community structure and distribution. In addition, the migratory behavior of juvenile and adult fish is directly related to seasonal patterns of prey abundance and changes in environmental conditions, especially water temperature. Prey supply is particularly critical for the starvation-prone early life history stages of fish.

The availability of food for planktivores is highly influenced by oceanographic properties. The seasonal warming of surface waters in temperate latitudes produces vertical stratification of the water column, which isolates sunlit surface waters from deeper, nutrient-rich water, leading to reduced primary productivity. In certain areas, upwelling, induced by wind, storms, and tidal mixing, inject nutrients back into the photic zone, stimulating primary production. Changes in primary production from upwelling and other oceanographic processes affect the amount of organic matter available for other organisms higher up in the food chain, and thus influence their abundance and distribution. Some of the organic matter produced in the photic zone sinks to the bottom and provides food for benthic organisms. In this way, oceanographic properties can also influence the food availability for sessile benthic organisms. In shallower water, benthic macro and microalgae also contribute to primary production. Recent research on benthic primary productivity indicates that benthic microalgae may contribute more to primary production than has been originally estimated (Cahoon 1999).

Benthic organisms provide an important food source for many managed species. Populations of bottom-dwelling sand lance are important food sources for many piscivorous species, and benthic invertebrates are the main source of nutrition for many demersal fishes. Temporal and spatial variations in benthic community structure affect the distribution and abundance of bottom-feeding fish. Likewise, the abundance and species composition of benthic communities are affected by a number of environmental factors including temperature, sediment type, and the amount of organic matter.

A number of recent studies illustrate the research that has addressed habitat associations for demersal juvenile fish. In shallow, nearshore coastal and estuarine waters of the northeast region, effects of physical habitat factors and prey availability on the abundance and distribution of young-of-the-year flounder (various species) have been investigated in nearshore and estuarine habitats in Connecticut, New Jersey, and North Carolina (Phelan et al. 2001, Stoner et al. 2001, Manderson et

al. 2000, Howell et al. 1999, Walsh et al. 1999, and Rountree and Able 1992). There are few comparable studies of more open, continental shelf environments. In the northeast U.S., Steves et al. (1989) identified depth, bottom temperature, and time of year as primary factors delineating settlement and nursery habitats for juvenile silver hake and yellowtail flounder in the mid-Atlantic Bight. Also, in a series of publications, Auster et al. (1991, 1995, 1997) correlated the spatial distributions of benthic juvenile fish (e.g. silver hake) with changes in microhabitat type on sand bottom at various open shelf locations in southern New England.
In addition to providing food sources, another important functional value of benthic habitat is the shelter and refuge from predators provided by structure. Three dimensional structure is provided by physical features such as boulders, gravel and cobble, sand waves and ripples, and mounts, burrows and depressions created by organisms. Structure is also provided by emergent epifauna.

The importance of benthic habitat complexity was discussed by Auster (1998a) and Auster and Langton (1999) in the context of providing a conceptual model to visualize patterns in fishing gear impacts across a gradient of habitat types. Based on this model, habitat value increases with increased structural complexity, from the lowest value in flat sand and mud to the highest value in piled boulders. The importance of habitat complexity to federally managed species is a key issue in the Northeast region. The information that is known about monkfish habitat associations and functions, as well as the habitats potentially impacted by the monkfish fishery are described in Section 5.4.

5.1.4 Biological Characteristics of Regional Systems

5.1.4.1 Gulf of Maine

The Gulf of Maine's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. The greatest number of invertebrates in this region are classified as mollusks, followed by annelids, crustaceans, echinoderms and other (Theroux and Wigley 1998). By weight, the order of taxa changes to echinoderms, mollusks, other, annelids and crustaceans. Watling (1998) used numerical classification techniques to separate benthic invertebrate samples into seven types of bottom assemblages. These assemblages are identified in Table 23 and their distribution is depicted in Figure 13. This classification system considers benthic assemblage, substrate type and water properties.

An in-depth review of GOM habitat types has been prepared by Brown (1993). Although still preliminary, this classification system is a promising approach. It builds on a number of other schemes, including Cowardin et al. (1979), and tailors them to Maine's marine and estuarine environments. A significant factor that is included in this review (but has been neglected in others) is a measure of "energy" in a habitat. Energy could be a reflection of wind, waves, or currents present. This is a particularly important consideration in a review of fishing gear impacts since it indicates the natural disturbance regime of a habitat. The amount and type of natural disturbance is in turn an indication of the habitat's resistance to and recoverability from disturbance by fishing gear. Although this work appears to be complete in its description of habitat types, unfortunately, the distribution of many of the habitats are unknown.

Demersal fish assemblages for the Gulf of Maine and Georges Bank were part of broad scale geographic investigations conducted by Mahon et al. (1998) and Gabriel (1992). Both these studies and a more limited study by Overholtz and Tyler (1985) found assemblages that were consistent over space and time in this region. In her analysis, Gabriel found that the most persistent feature over time in assemblage structure from Nova Scotia to Cape Hatteras was the boundary separating assemblages between the Gulf of Maine and Georges Bank, which occurred at approximately the 100 m isobath on northern Georges Bank.

Overholtz & Tyler (1985) identified five assemblages for this region (Table 24). The Gulf of Maine-deep assemblage included a number of species found in other assemblages, with the exception of American plaice and witch flounder, which was unique to this assemblage. Gabriel's approach did not allow species to co-occur in assemblages, and also classified these two species as unique to the deepwater Gulf of Maine-Georges Bank assemblage. Results of these two studies are compared in Table 24. Auster et al. (2001) went a step further, and related species clusters on Stellwagen Bank to reflectance values of different substrate types in an attempt to use fish distribution as a proxy for seafloor habitat distribution. They found significant reflectance associations for twelve of 20 species, including American plaice (fine substrate), and haddock (coarse substrate). Species clusters and associated substrate types are given in Table 25.

Benthic Assemblage	Benthic Community Description
1	Comprises all sandy offshore banks, most prominently Jeffreys Ledge, Fippennies Ledge, and Platts Bank; depth on top of banks about 70 m; substrate usually coarse sand with some gravel; fauna characteristically sand dwellers with an abundant interstitial component.
2	Comprises the rocky offshore ledges, such as Cashes Ledge, Sigsbee Ridge and Three Dory Ridge; substrate either rock ridge outcrop or very large boulders, often with a covering of very fine sediment; fauna predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers; overlying water usually cold Gulf of Maine Intermediate Water.
3	Probably extends all along the coast of the Gulf of Maine in water depths less than 60 m; bottom waters warm in summer and cold in winter; fauna rich and diverse, primarily polychaetes and crustaceans; probably consists of several (sub-) assemblages due to heterogeneity of substrate and water conditions near shore and at mouths of bays.
4	Extends over the soft bottom at depths of 60 to 140 m, well within the cold Gulf of Maine Intermediate Water; bottom sediments primarily fine muds; fauna dominated by polychaetes, shrimp, and cerianthid anemones.
5	A mixed assemblage comprising elements from the cold water fauna as well as a few deeper water species with broader temperature tolerances; overlying water often a mixture of Intermediate Water and Bottom Water, but generally colder than 7° C most of the year; fauna sparse, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthid also present.
6	Comprises the fauna of the deep basins; bottom sediments generally very fine muds, but may have a gravel component in the offshore morainal regions; overlying water usually 7 to 8° C, with little variation; fauna shows some bathyal affinities but densities are not high, dominated by brittle stars and sea pens, and sporadically by a tube-making amphipod.
7	The true upper slope fauna that extends into the Northeast Channel; water temperatures are always above 8° and salinities are at least 35 ppt; sediments may be either fine muds or a mixture of mud and gravel.

Table 23- Gulf of Maine benthic assemblages as identified by Watling (1998).

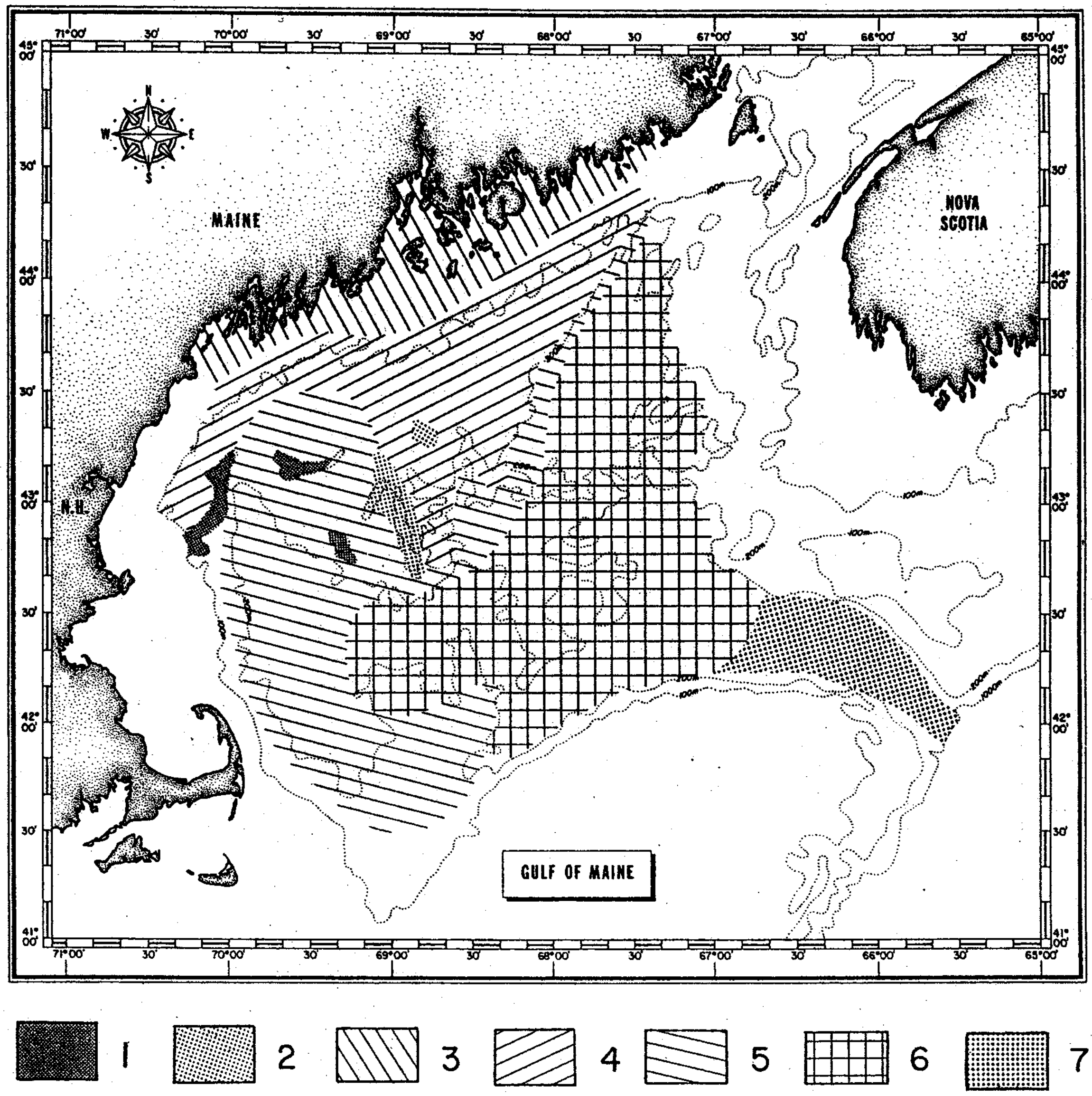


Figure 13- Distribution of the seven major benthic assemblages in the Gulf of Maine as determined from both soft bottom quantitative sampling and qualitative hard bottom sampling.

The assemblages are characterized as follows: 1. Sandy offshore banks; 2. Rocky offshore ledges; 3. Shallow (<50 m) temperate bottoms with mixed substrate; 4. Boreal muddy bottom, overlain by Maine Intermediate Water, 50 – 160 m (approx.); 5. Cold deep water, species with broad tolerances, muddy bottom; 6. Deep basin warm water, muddy bottom; 7. Upper slope water, mixed sediment. Source: Watling 1998.

Overholtz & Tyler (1984)		Gabriel (1992)	
Assemblage	**Species**	**Species**	**Assemblage**
Slope & Canyon	offshore hake blackbelly rosefish Gulf stream flounder fourspot flounder monkfish, whiting white hake, red hake	offshore hake blackbelly rosefish Gulf stream flounder fawn cusk-eel, longfin hake, armored sea robin	**Deepwater**
Intermediate	whiting red hake monkfish Atlantic cod, haddock, ocean pout, yellowtail flounder, winter skate, little skate, sea raven, longhorn sculpin	whiting red hake monkfish short-finned squid, spiny dogfish, cusk	**Combination of Deepwater Gulf of Maine/Georges Bank & Gulf of Maine-Georges Bank Transition**
Shallow	Atlantic cod haddock pollock whiting white hake red hake monkfish ocean pout	Atlantic cod haddock pollock	**Gulf of Maine-Georges Bank Transition Zone**
	yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin summer flounder sea raven, sand lance	yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin	**Shallow Water Georges Bank-Southern New England**
Gulf of Maine-Deep	white hake American plaice witch flounder thorny skate whiting, Atlantic cod, haddock, cusk Atlantic wolffish	white hake American plaice witch flounder thorny skate, redfish	**Deepwater Gulf of Maine-Georges Bank**
Northeast Peak	Atlantic cod haddock pollock ocean pout, winter flounder, white hake, thorny skate, longhorn sculpin	Atlantic cod haddock pollock	**Gulf of Maine-Georges Bank Transition Zone**

Table 24- Comparison of demersal fish assemblages of Georges Bank and Gulf of Maine identified by Overholtz and Tyler (1985) and Gabriel (1992).
Gabriel analyzed a greater number of species and did not overlap assemblages.

SUBSTRATE TYPE									
Coarse		**Coarse**		**Wide Range**		**Fine**		**Fine**	
Species	**Mean**	**Species**	**Mean**	**Species**	**Mean**	**Species**	**Mean**	**Species**	**Mean**
N. Sand Lance	1172.0	Haddock	13.1	American plaice	63.3	Americanplaice	152.0	Whiting	275.0
Atlantic herring	72.2	Atlantic cod	7.3	N. sand lance	53.0	Acadian redfish	31.3	American plaice	97.1
Spiny dogfish	38.4	American plaice	5.3	Atlantic herring	28.5	Whiting	29.5	Atlantic mackerel	42.0
Atlantic cod	37.4	Whiting	3.3	Whiting	22.4	Atlantic herring	28.0	Pollock	41.1
Longhorn sculpin	29.7	Longhorn sculpin	2.0	Acadian redfish	16.0	Red hake	26.1	Alewife	37.2
American plaice	28.0	Yellowtail flounder	1.9	Atlantic cod	14.0	Witch flounder	23.8	Atlantic herring	32.0
Haddock	25.7	Spiny dogfish	1.6	Longhorn sculpin	9.5	Atlantic cod	13.1	Atlantic cod	18.1
Yellowtail flounder	20.2	Acadian redfish	1.6	Haddock	9.1	Haddock	12.7	Longhorn sculpin	16.8
Whiting	7.5	Ocean pout	1.3	Pollock	7.9	Longhorn sculpin	12.5	Red hake	15.2
Ocean pout	9.0	Alewife	1.1	Red hake	6.2	Daubed shanney	11.4	Haddock	13.2
No. tows = 83		**No. tows = 60**		**No. tows = 159**		**No. tows = 66**		**No. tows = 20**	

Table 25- Ten dominant species and mean abundance/tow^{-1} from each cluster species group and its associated substrate type as determined by reflectance value, from Stellwagen Bank, Gulf of Maine (Auster et al. 2001).

5.1.4.2 Georges Bank

The interaction of several environmental factors including availability and type of sediment, current speed and direction, and bottom topography have been found to combine to form seven sedimentary provinces on eastern Georges Bank (Valentine et al. 1993), which are outlined in Table 26 and depicted in Figure 14.

Theroux and Grosslein (1987) identified four macrobenthic invertebrate assemblages that corresponded with previous work in the geographic area. They noted that it is impossible to define distinct boundaries between assemblages because of the considerable intergrading that occurs between adjacent assemblages; however, the assemblages are distinguishable. Their assemblages are associated with those identified by Valentine et al. (1993) in Table 26.

The Western Basin assemblage (Theroux and Grosslein 1987) is found in the upper Great South Channel region at the northwestern corner of the bank, in comparatively deep water (150-200 m) with relatively slow currents and fine bottom sediments of silt, clay and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers. Representative organisms include bivalves (*Thyasira flexuosa, Nucula tenuis, Musculus discors*), annelids (*Nephtys incisa, Paramphinome pulchella, Onuphis opalina, Sternaspis scutata*), the brittle star (*Ophiura sarsi*), the amphipod *Haploops tubicola*, and red crab (*Geryon quedens*). Valentine et al. 1993 did not identify a comparable assemblage; however, this assemblage is geographically located adjacent to Assemblage 5 as described by Watling (1998) (Table 23, Figure 13).

The Northeast Peak assemblage is found along the Northern Edge and Northeast Peak, which varies in depth and current strength and includes coarse sediments, mainly gravel and coarse sand with interspersed boulders, cobbles and pebbles. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and tubiferous annelids) or free-living (brittlestars, crustaceans and polychaetes), with a characteristic absence of burrowing forms. Representative organisms include amphipods (*Acanthonotozoma serratum, Tiron spiniferum*), the isopod *Rocinela americana*, the barnacle *Balanus hameri*, annelids (*Harmothoe imbricata, Eunice pennata, Nothria conchylega,* and *Glycera capitata*), sea scallops (*Placopecten magellanicus*), brittlestars (*Ophiacantha bidentata, Ophiopholis aculeata*), and soft corals (*Primnoa resedaeformis, Paragorgia arborea*).

The Central Georges assemblage occupies the greatest area, including the central and northern portions of the bank in depths less than 100 m. Medium grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large in size with burrowing or motile habits. Sand dollars (*Echinarachnius parma*) are most characteristic of this assemblage. Other representative species include mysids (*Neomysis americana, Mysidopsis bigelowi*), the isopod *Chiridotea tuftsi*, the cumacean *Leptocuma minor*, the amphipod *Protohaustorius wigleyi*, annelids (*Sthenelais limicola, Goniadella gracilis, Scalibregma inflatum*), gastropods (*Lunatia heros, Nassarius trivittatus*), the starfish *Asterias vulgaris*, the shrimp *Crangon septemspinosa* and the crab *Cancer irroratus*.

The Southern Georges assemblage is found on the southern and southwestern flanks at depths from 80 m to 200 m, where fine grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids and starfish genus *Astropecten*. Representative organisms include amphipods (*Ampelisca compressa, Erichthonius rubricornis, Synchelidium americanum*), the cumacean *Diastylis quadrispinosa,* annelids (*Aglaophamus circinata, Nephtys squamosa, Apistobranchus tullbergi*), crabs (*Euprognatha rastellifera, Catapagurus sharreri*) and the shrimp *Munida iris*.

Sedimentary Province	Depth (m)	Description	Benthic Assemblage
Northern Edge / Northeast Peak (1)	40-200	Dominated by gravel with portions of sand, common boulder areas, and tightly packed pebbles. Representative epifauna (bryozoa, hydrozoa, *anemones,*and *calcareous* worm tubes) are abundant in areas of boulders. *Strong tidal and storm currents.*	Northeast Peak
Northern Slope & Northeast Channel (2)	200-240	Variable sediment type (gravel, gravel-sand, and sand) scattered bedforms. This is a transition zone between the northern edge and southern slope. *Strong tidal and storm currents.*	Northeast Peak
North / Central Shelf (3)	60-120	Highly variable sediment type (ranging from gravel to sand) with rippled sand, large bedforms, and patchy gravel lag deposits. *Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.*	Central Georges
Central & Southwestern Shelf - *shoal ridges* (4)	10-80	Dominated by sand (fine and medium grain) with large sand ridges, dunes, waves, and ripples. Small bedforms in southern part. *Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.*	Central Georges
Central & Southwestern Shelf - *shoal troughs* (5)	40-60	Gravel (including gravel lag) and gravel-sand between large sand ridges. Patch large bedforms. Strong currents. (Few samples – submersible observation noted presence of gravel lag, rippled gravel-sand, and large bedforms.) *Minimal epifauna on gravel due to sand movement. Representative epifauna in sand areas include amphipods, sand dollars, and burrowing anemones.*	Central Georges
Southeastern Shelf (6)	80-200	Rippled gravel-sand (medium and fine-grained sand) with patchy large bedforms and gravel lag. Weaker currents; ripples are formed by intermittent storm currents. Representative epifauna include sponges attached to shell fragments and amphipods.	Southern Georges
Southeastern Slope (7)	400-2000	Dominated by silt and clay with portions of sand (medium and fine) with rippled sand on shallow slope and smooth silt-sand deeper.	none

Table 26- Sedimentary provinces of Georges Bank, as defined by Valentine *et al.* (1993) and Valentine and Lough (1991) with additional comments by Valentine (personal communication) and Benthic Assemblages assigned from Theroux and Grosslein (1987).

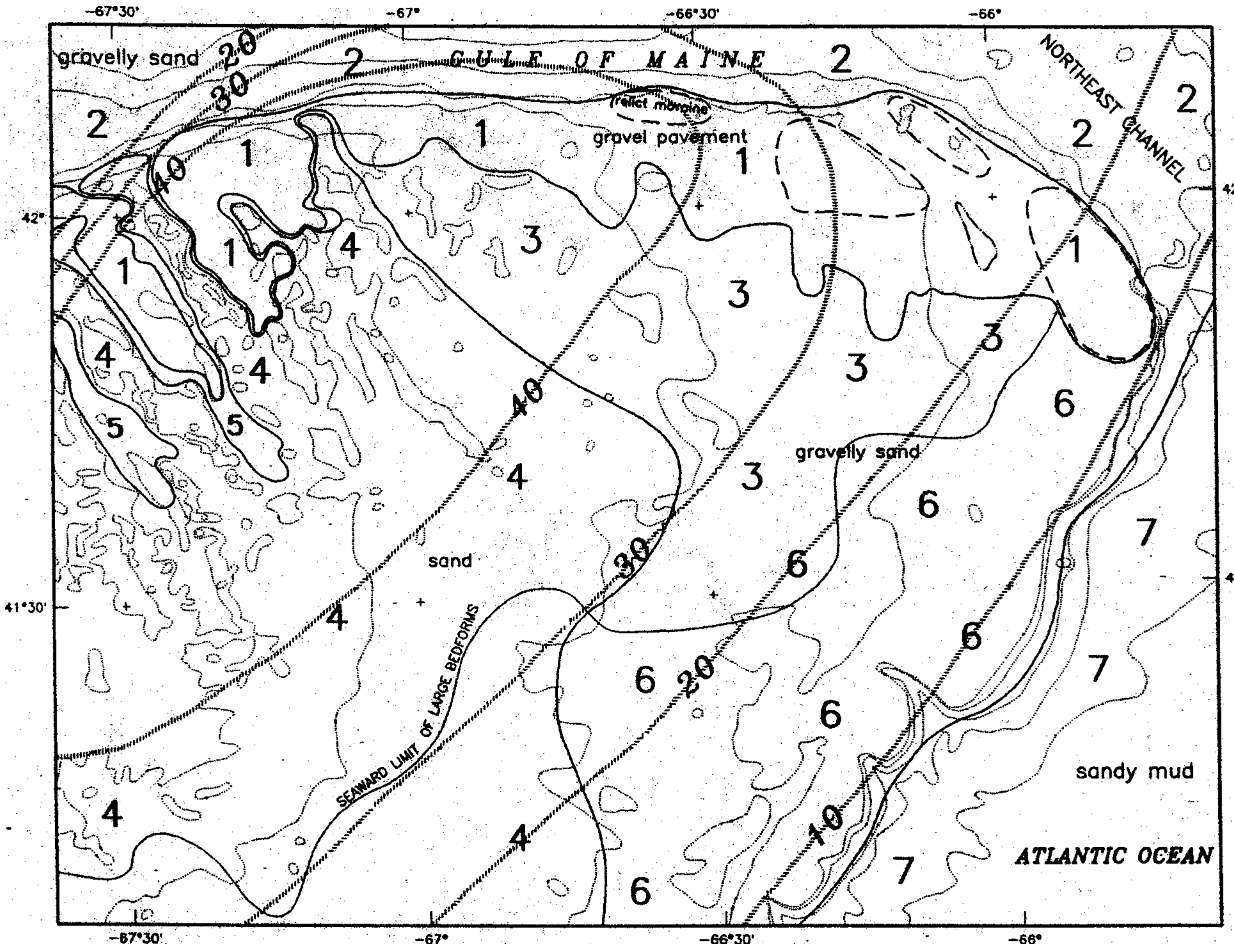


Figure 14- Sedimentary provinces of eastern Georges Bank based on criteria of sea floor morphology, texture, sediment movement and bedforms, and mean tidal bottom current speed (cm/sec).

Relict moraines (bouldery sea floor) are enclosed by dashed lines. Source: Valentine and Lough (1991).

Along with high levels of primary productivity, Georges Bank has been historically characterized by high levels of fish production. Several studies have attempted to identify demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel identified six assemblages, which are compared with the results of Overholtz & Tyler (1984) in Table 24. Mahon et al. (1998) found similar results.

A few recent studies (Garrison 2000, Garrison and Link 2000, Garrison 2001) demonstrate the persistence of spatio-temporal overlap among numerically dominant, commercially valuable and /or ecologically important species. The studies by Garrison and associates utilized an index of spatial overlap based on the NOAA spring and fall surveys (Figure 15 -Figure 17). He found that among the community of fish species on Georges Bank, only a very few species have high spatial overlaps with other species. The most notable example is silver hake (whiting), which had a very high overlap with most other species, suggestive of a broad distribution. Trends in spatial overlap over time generally reflect changes in species abundance. During the 1960s, haddock and yellowtail flounder were both widely distributed and had high spatial overlaps with other species. As abundance of these species declined through the 1970s into the 1990s, their spatial range contracted and their overlaps with other species subsequently declined. In contrast to this, species whose abundance has increased through time show an expansion of ranges and increased spatial overlap with other species. Interestingly and to confirm other studies of fish assemblages, the major species assemblages have been generally consistent across time given the changes in relative abundance.

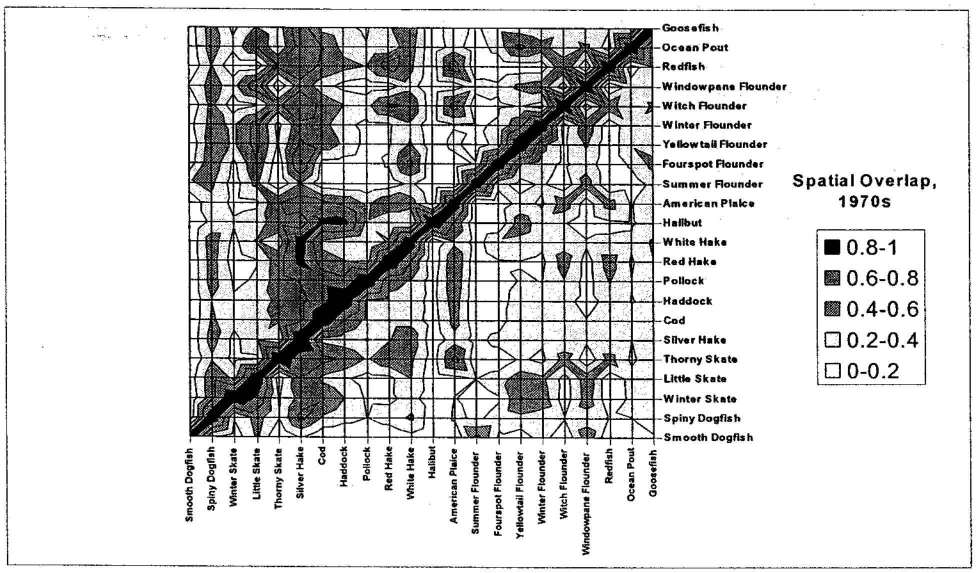


Figure 15- Spatial overlap of primary finfish species on Georges Bank, 1970s (as modified from Garrison and Link 2000)

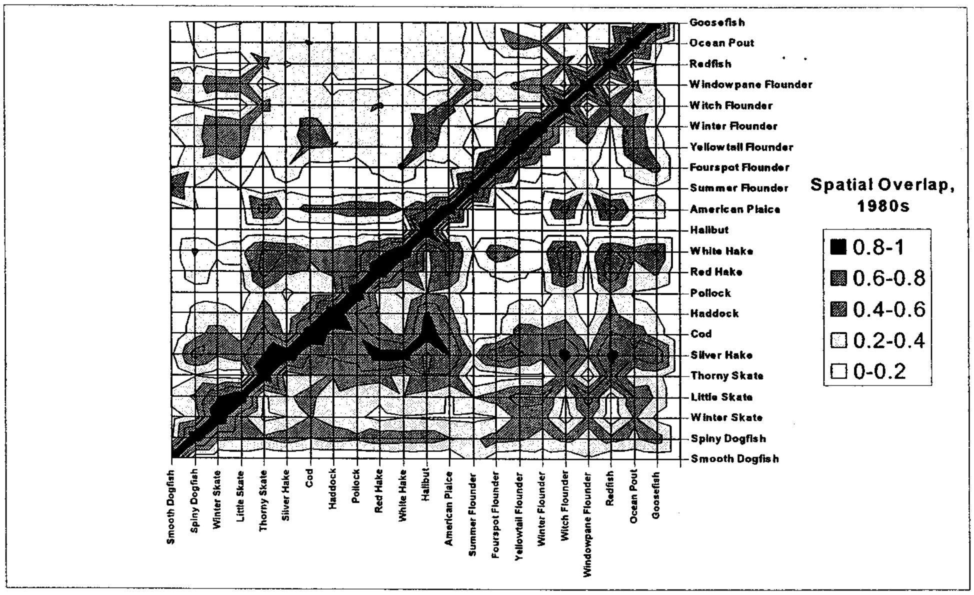


Figure 16- Spatial overlap of primary finfish species on Georges Bank, 1980s (as modified from Garrison and Link 2000)

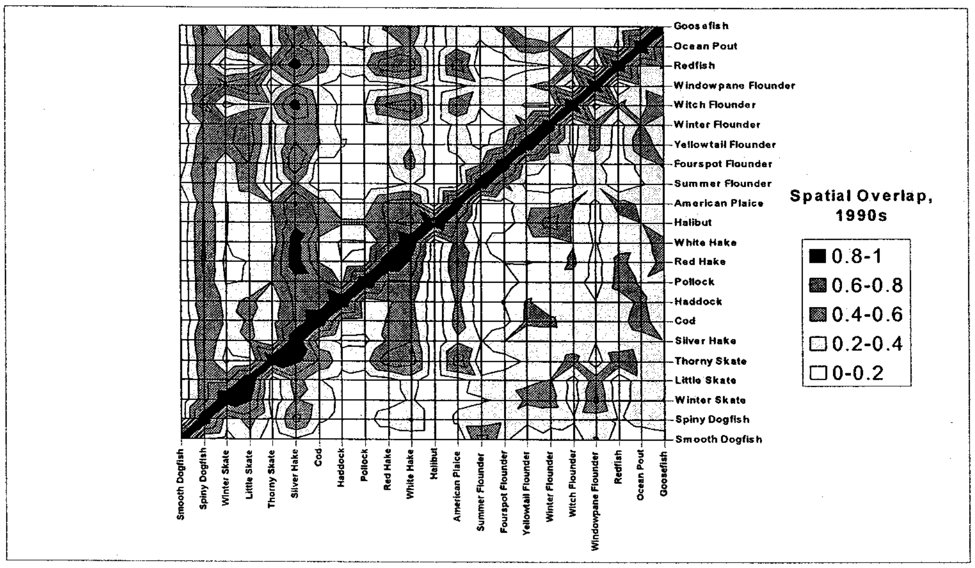


Figure 17- Spatial overlap of primary finfish species on Georges Bank, 1990s (as modified from Garrison and Link 2000)

Seasonal trends in spatial overlap are also apparent (Figure 18 - Figure 21). Spiny dogfish, for example, has a far stronger association and a far broader range of species' associations in the winter than it does in the summer. Similarly, winter skate is a more prevalent co-correspondent in winter than other times of the year. This metric, like the spatial overlap trend over time (above), is sensitive to abundance as evidenced by the lack of spatial overlap between Atlantic halibut and any other species.

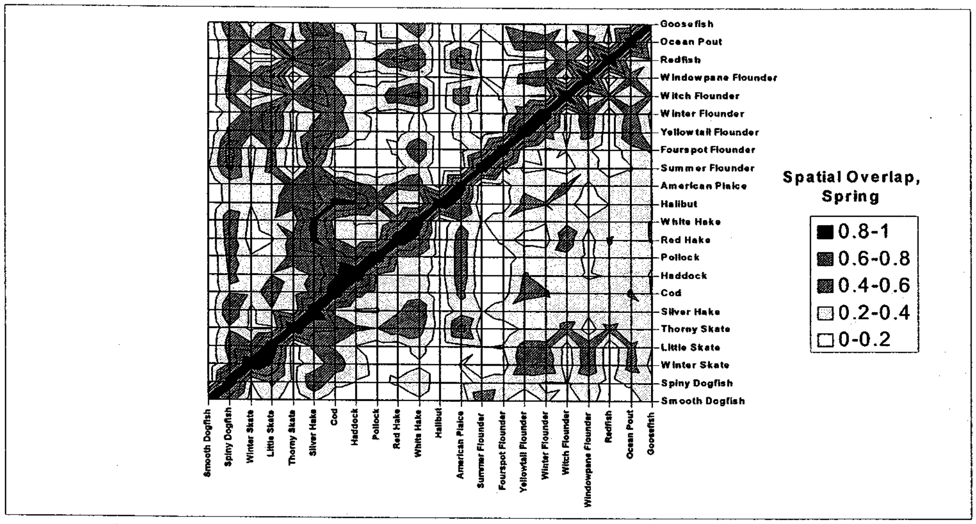


Figure 18- Spatial overlap of primary finfish species on Georges Bank, spring 1970-1998 (as modified from Garrison and Link 2000)

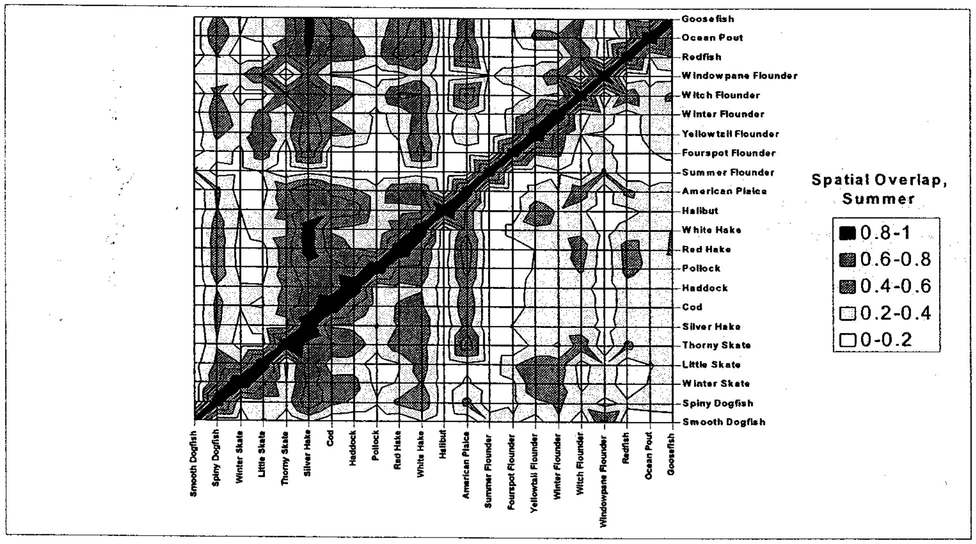


Figure 19- Spatial overlap of primary finfish species on Georges Bank, Summer 1970-1998 (as modified from Garrison and Link 2000)

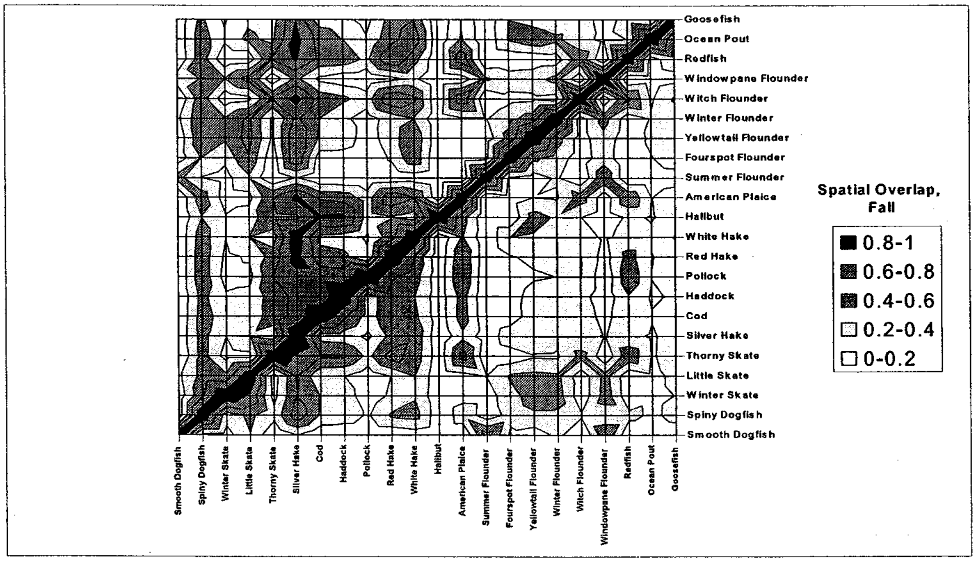


Figure 20- Spatial overlap of primary finfish species on Georges Bank, fall 1970-1998 (as modified from Garrison and Link 2000)

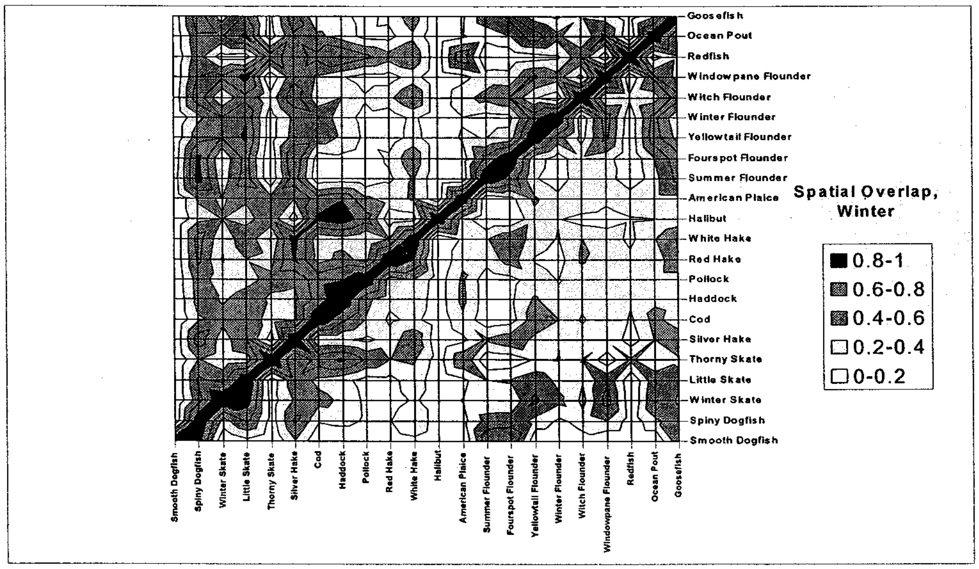


Figure 21- Spatial overlap of primary finfish species on Georges Bank, winter 1970-1998 (as modified from Garrison and Link 2000)

5.1.4.3 Mid-Atlantic Bight

Three broad faunal zones related to water depth and sediment type were identified for the Mid-Atlantic by Pratt (1973). The "sand fauna" zone was defined for sandy sediments (1% or less silt) which are at least occasionally disturbed by waves, from shore out to 50 m. The "silty sand fauna" zone occurred immediately offshore from the sand fauna zone, in stable sands containing at least a few percent silt and slightly more (2%) organic material. Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley, and support the "silt-clay fauna."

Building on Pratt's work, the Mid-Atlantic shelf was further divided by Boesch (1979) into seven bathymetric/morphologic subdivisions based on faunal assemblages (Table 27, Figure 22). Sediments in the region studied (Hudson Shelf Valley south to Chesapeake Bay) were dominated by sand with little finer material. Ridges and swales are important morphological features in this area. Sediments are coarser on the ridges, and the swales have greater benthic macrofaunal density, species richness and biomass. Faunal species composition differed between these features, and Boesch incorporated this variation in his subdivisions (Table 27). Much overlap of species distributions was found between depth zones, so the faunal assemblages represented more of a continuum than distinct zones.

Habitat Type (after Boesch 1979)	Description		
	Depth (m)	Characterization (Pratt faunal zone)	Characteristic Benthic Macrofauna
Inner shelf	0-30	characterized by coarse sands with finer sands off MD and VA (sand zone)	Polychaetes: Polygordius, Goniadella, Spiophanes
Central shelf	30-50	(sand zone)	Polychaetes: Spiophanes, Goniadella Amphipod: Pseudunciola
Central and inner shelf swales	0-50	occurs in swales between sand ridges (sand zone)	*Polychaetes:* Spiophanes, Lumbrineris, Polygordius
Outer shelf	50-100	(silty sand zone)	Amphipods: Ampelisca vadorum, Erichthonius Polychaetes: Spiophanes
Outer shelf swales	50-100	occurs in swales between sand ridges (silty sand zone)	Amphipods: Ampelisca agassizi, Unciola, Erichthonius
Shelf break	100-200	(silt-clay zone)	not given
Continental slope	>200	(none)	not given

Table 27- Mid-Atlantic habitat types as described by Pratt (1973) and Boesch (1979) with characteristic macrofauna as identified in Boesch 1979.

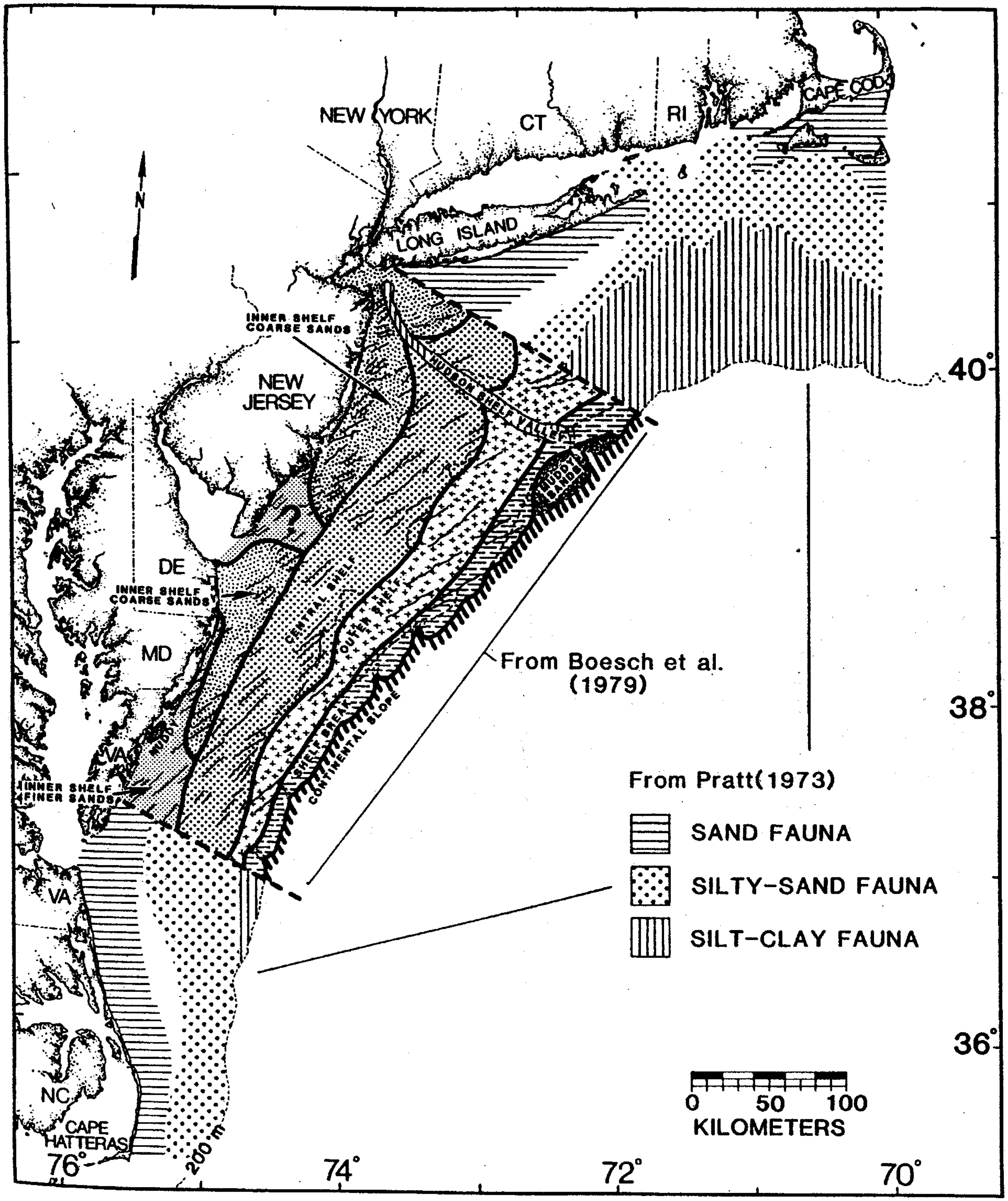


Figure 22- Schematic representation of major macrofaunal zones on the Mid-Atlantic shelf. Approximate location of ridge fields indicated. Source: Reid and Steimle (1988).

Wigley and Theroux (1981) found a general trend in declining macrobenthic invertebrate density from coastal areas offshore to the slope, and on the shelf from southern New England south to Virginia/North Carolina. There were no detectable trends in density from north to south on the slope. Number of individuals was greatest in gravel sediments, and declined in sand-gravel, sand-shell, sand, shell, silty sand, silt and finally clay. However, biomass of benthic macrofauna was greatest in shell habitat, followed by silty sand, gravel, sand-gravel, sand, sand-shell, silt and clay.

Demersal fish assemblages were described at a broad geographic scale for the continental shelf and slope from Cape Chidley, Labrador to Cape Hatteras, North Carolina (Mahon *et al.* 1998) and from Nova Scotia to Cape Hatteras (Gabriel 1992). Factors influencing species distribution included latitude and depth.

Results of these studies were similar to an earlier study confined to the Mid-Atlantic Bight continental shelf (Colvocoresses and Musick 1983). In this study, there were clear variations in species abundances, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. This is especially true for five strongly recurring species associations that varied slightly by season (Table 28). The boundaries between fish assemblages generally followed isotherms and isobaths. The assemblages were largely similar between the spring and fall collections, with the most notable change being a northward and shoreward shift in the temperate group in the spring.

Season	Species Assemblage				
	Boreal	Warm temperate	Inner shelf	Outer shelf	Slope
Spring	Atlantic cod little skate sea raven monkfish winter flounder longhorn sculpin ocean pout whiting red hake white hake spiny dogfish	black sea bass summer flounder butterfish scup spotted hake northern searobin	windowpane	fourspot flounder	shortnose greeneye offshore hake blackbelly rosefish white hake
Fall	white hake whiting red hake monkfish longhorn sculpin winter flounder yellowtail flounder witch flounder little skate spiny dogfish	black sea bass summer flounder butterfish scup spotted hake northern searobin smooth dogfish	windowpane	fourspot flounder fawn cusk eel gulf stream flounder	shortnose greeneye offshore hake blackbelly rosefish white hake witch flounder

Table 28- Major Recurrent Demersal Finfish Assemblages of the Mid-Atlantic Bight During Spring and Fall as Determined by Colvocoresses and Musick (1983).

Steimle and Zetlin (2000) described representative finfish species and epibenthic/epibiotic and motile epibenthic invertebrates associated with mid-Atlantic reef habitats (Table 29). Most of these reefs are human-made structures.

Location (Type)	Representative Flora & Fauna		
	Epibenthic/Epibiotic	Motile Epibenthic Invertebrates	Fish
Estuarine (Oyster reefs, blue mussel beds,other hard surfaces, semi-hard clay and Spartina peat reefs)	Oyster, barnacles, ribbed mussel, blue mussel, algae, sponges, tube worms, anemones, hydroids, bryozoans, slipper shell, jingle shell, northern stone coral, sea whips, tunicates, caprellid amphipods, wood borers	Xanthid crabs, blue crab, rock crabs, spider crab, juvenile American lobsters, sea stars	Gobies, spot, striped bass, black sea bass, white perch, toadfish, scup, drum, croaker, spot, sheepshead porgy, pinfish, juvenile and adult tautog, pinfish, northern puffer, cunner, sculpins, juvenile and adult Atlantic cod, rock gunnel, conger eel, American eel, red hake, ocean pout, white hake, juvenile pollock
Coastal (exposed rock/soft marl, harder rock, wrecks & artificial reefs, kelp, other materials)	Boring mollusks (piddocks), red algae, sponges, anemones, hydroids, northern stone coral, soft coral, sea whips, barnacles, blue mussel, horse mussel, bryozoans, skeleton and tubiculous amphipods, polychaetes, jingle shell, sea stars	American lobster, Jonah crab, rock crabs, spider crab, sea stars, urchins, squid egg clusters	Black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black brouper, smooth dogfish, sumemr flounder, scad, bluefish amberjack, Atlantic cod, tautog, ocean pout, conger eel, sea raven, rock gunnel, radiated shanny
Shelf (rocks & boulders, wrecks & artificial reefs, other solid substrates)	Boring mollusks (piddocks) red algae, sponges, anemones, hydroids, stone coral, soft coral, sea whips, barnacles, blue mussels, horse mussels, bryozoans, amphipods, polychaetes	American lobster, Jonah crabs, rock crabs, spider crabs, sea stars, urchins, squid egg clusters (with addition of some deepwater taxa at shelf edge)	Black sea bass, scup, tautog, cunner, gag, sheepshead porgy, round herring, sardines, amberjack, spadefish, gray triggerfish, mackerels, small tunas, spottail pinfish, tautog, Atlantic cod, ocean pout, red hake, conger eel, cunner, sea raven, rock gunnel, pollock, white hake
Outer shelf (reefs and clay burrows including "pueblo village community")			Tilefish, white hake, conger eel

Table 29- Mid-Atlantic Reef Types, Location, and Representative Flora and Fauna, as Described in Steimle and Zetlin (2000)

5.1.4.4 Continental Slope

Polychaetes represent the most important slope faunal group in terms of numbers of individuals and species (Wiebe et al. 1987). Ophiuroids are considered to be among the most abundant slope organisms, but this group is comprised of relatively few species. The taxonomic group with the highest species diversity includes the peracarid crustaceans represented by Amphipoda, Cumacea, Isopoda, and the Tanaidacea. Some species of the slope are widely distributed, while others appear to be restricted to particular ocean basins. The ophiuroids and bivalves appear to have the broadest distributions, while the peracarid crustaceans appear to be highly restricted because they brood their young, and lack a planktonic stage of development. In general, gastropods do not appear to be very abundant, however, past studies are inconclusive since they have not collected enough individuals for large-scale community and population studies.

In general, slope-inhabiting benthic organisms are strongly zoned by depth and/or water temperature, although these patterns are modified by the presence of topography, including canyons, channels, and current zonations (Hecker 1990). Moreover, at depths of less than 800 meters, the fauna is extremely variable and the relationships between faunal distribution and substrate, depth, and geography are less obvious (Wiebe et al. 1987). Fauna occupying hard-surface sediments are not as dense as in comparable shallow-water habitats (Wiebe et al. 1987), but there is an increase in species diversity from the shelf to the intermediate depths of the slope. Diversity then declines again in the deeper waters of the continental rise and plain. Hecker (1990) identified four megafaunal zones on the slope of Georges Bank and southern New England (Table 30).

Zone	Approximate Depth (m)	Gradient	Current	Fauna
Upper Slope	300-700	Low	strong	Dense filter feeders; Scleratinians (*Dasmosmilia lymani, Flabellum alabastrum*), quill worm (*Hyalinoecia*)
Upper Middle Slope	500-1300	High	moderate	Sparse scavengers; red crab (*Geryon quinqueidens*), long-nosed eel (*Synaphobranchus*), common grenadier (*Nezumia*). Alcyonarians (*Acanella arbuscula, Eunephthya florida*) in areas of hard substrate
Lower Middle Slope/Transition	1200-1700	High	moderate	Sparse suspension feeders; cerianthids, sea pen (*Distichoptilum gracile*)
Lower Slope	>1600	Low	strong	Dense suspension & deposit feeders; ophiurid (*Ophiomusium lymani*), cerianthid, sea pen

Table 30- Faunal zones of the continental slope of Georges Bank and southern New England (from Hecker 1990)

One group of organisms of interest because of the additional structure they can provide for habitat and their potential long life span are the Alcyonarian soft corals. Soft corals can be bush or treelike in shape; species found in this form attach to hard substrates such as rock outcrops or gravel. These species can range in size from a few millimeters to several meters, and the trunk diameter of large specimens can exceed 10 cm. Other Alcyonarians found in this region include sea pens and sea pansies (Order Pennatulacea), which are found in a wider range of substrate types. In their survey of northeastern U.S. shelf macrobenthic invertebrates, Theroux and Wigley (1998) found Alcyonarians (including soft corals *Alcyonium sp., Acanella sp., Paragorgia arborea, Primnoa reseda* and sea pens) in limited numbers in waters deeper than 50 m, and mostly at depths from 200-500 m. Alcyonarians were present in each of the geographic areas identified in the study (Nova Scotia, Gulf of Maine, Southern New England Shelf, Georges Slope, Southern New England Slope) except Georges Bank. However, *Paragorgia* and *Primnoa* have been reported in the Northeast Peak region of Georges Bank (Theroux and Grosslein 1987). Alcyonarians were most abundant by weight in the Gulf of Maine, and by number on the Southern New England Slope (Theroux and Wigley 1998). In this study, Alcyonarians other than sea pens were collected only from gravel and rocky outcrops. Theroux and Wigley (1998) also found stony corals (*Astrangia danae* and *Flabellum sp.*) in the northeast region, but they were uncommon. In similar work on the mid-Atlantic shelf, the only Alcyonarians encountered were sea pens (Wigley and Theroux 1981). The stony coral *Astrangia danae*, was also found, but its distribution and abundance was not discussed, and is assumed to be minimal.

As opposed to most slope environments, canyons may develop a lush epifauna. Hecker et al. (1983) found faunal differences between the canyons and slope environments. Hecker and Blechschmidt (1979) suggested that faunal differences were due at least in part to increased environmental heterogeneity in the canyons, including greater substrate variability and nutrient enrichment. Hecker et al. (1983) found highly patchy faunal assemblages in the canyons, and also found additional faunal groups located in the canyons, particularly on hard substrates, that do not appear to occur in other slope environments. Canyons are also thought to serve as nursery areas for a number of species (Hecker 2001; Cooper et al. 1987). The canyon habitats in Table 31 were classified by Cooper et al. (1987).

Most finfish identified as slope inhabitants on a broad spatial scale (Gabriel 1992, Overholtz and Tyler 1985, and Colvocoresses and Musick 1983) (Table 24) are associated with canyon features as well (Cooper et al. 1987). Finfish identified by broad studies that were not included in Cooper et al. (1987) include offshore hake, fawn cusk-eel, longfin hake, witch flounder and armored searobin. Canyon species (Cooper et al. 1987) that were not discussed in the broad scale studies include squirrel hake, conger eel and tilefish. Cusk and ocean pout were identified by Cooper et al. (1987) as canyon species, but classified in other habitats by the broad scale studies.

Habitat Type	Geologic Description	Canyon Locations	Most Commonly Observed Fauna
I	Sand or semi-consolidated silt substrate (claylike consistency) with less than 5% overlay of gravel. Relatively featureless except for conical sediment mounds.	Walls & axis	Cerianthid, pandalid shrimp, white colonial anemone, Jonah crab, starfishes, portunid crab, greeneye, brittle stars, mosaic worm, red hake, four spot flounder, shell-less hermit crab, silver hake, gulf stream flounder
II	Sand or semi-consolidated silt substrate (claylike consistency) with more than 5% overlay of gravel. Relatively featureless.	Walls	Cerianthid, galatheid crab, squirrel hake, white colonial anemone, Jonah crab, silver hake, starfishes, ocean pout, brittle stars, shell-less hermit crab, greeneye
III	Sand or semi-consolidated silt (claylike consistency) overlain by siltstone outcrops and talus up to boulder size. Featured bottom with erosion by animals and scouring.	Walls	White colonial anemone, pandalid shrimp, cleaner shrimp, rock anemone, white hake, starfishes, ocean pout, conger eel, brittle star, Jonah crab, lobster, black-bellied rose fish, galatheid crab, mosaic worm, tilefish
IV	Consolidated silt substrate, heavily burrowed/excavated. Slope generally more than 5° and less than 50° Termed "pueblo village" habitat.	Walls	Starfishes, black-bellied rosefish, Jonah crab, lobster, white hake, cusk, ocean pout, cleaner shrimp, conger eel, tilefish, galatheid crab, shell-less hermit crab
V	Sand dune substrate.	Axis	Starfishes, white hake, Jonah crab, and monkfish

Table 31- Habitat Types for the Canyons of Georges Bank Described by Geologic Attributes and Characteristic Fauna (from Cooper *et al.* 1987).
Faunal characterization is for depths < 230 m only

5.1.4.5 Assemblages of Northeast Shelf Finfish Species Based on Feeding Habits

A guild is defined by Root (1967) as 'a group of species that exploit the same class of environmental resources in a similar way' and explicitly focuses on classifying species based upon their functional role in a community without regard to taxonomy. The guild is used to simplify the structure and dynamics of complex ecosystems regardless of the mechanism generating resource partitioning. Guild members play similar functional roles within ecosystems (Garrison and Link 2000).

Cluster analysis modified from Garrison and Link (2000) found 14 groups of finfish in the Northeast region with significant dietary similarities. These 14 guilds were broadly categorized into six trophic groups, emphasizing similarities in diet at very broad taxonomic levels. Within these groups, the trophic guilds reflect utilization of specific prey types. For example, Guild 6b (Figure 23) consumed primarily engraulids in contrast to other guilds in the piscivore group. The dietary guilds in the Northeast US shelf fish community reflect similarity in the utilization of specific prey categories. Within guilds, 10 to 15 prey taxa generally accounted for greater than 70% of predator diets and usually less than five prey accounted for greater than 50% of the diet. A relatively small set of prey taxa distinguishes the observed dietary guild structure.

The general guild structure and levels of dietary overlap in this system are consistent across both temporal and spatial scales. Complimentary analyses to the current study within the Georges Bank region identified similar trophic guilds, similar patterns of size-based shifts in diets, and general stability in the trophic guild structure over the last three decades (Garrison 2000). Despite the notable changes in species composition in the Northeast shelf fish community, the patterns of trophic resource use and guild structure are remarkably consistent (2000).

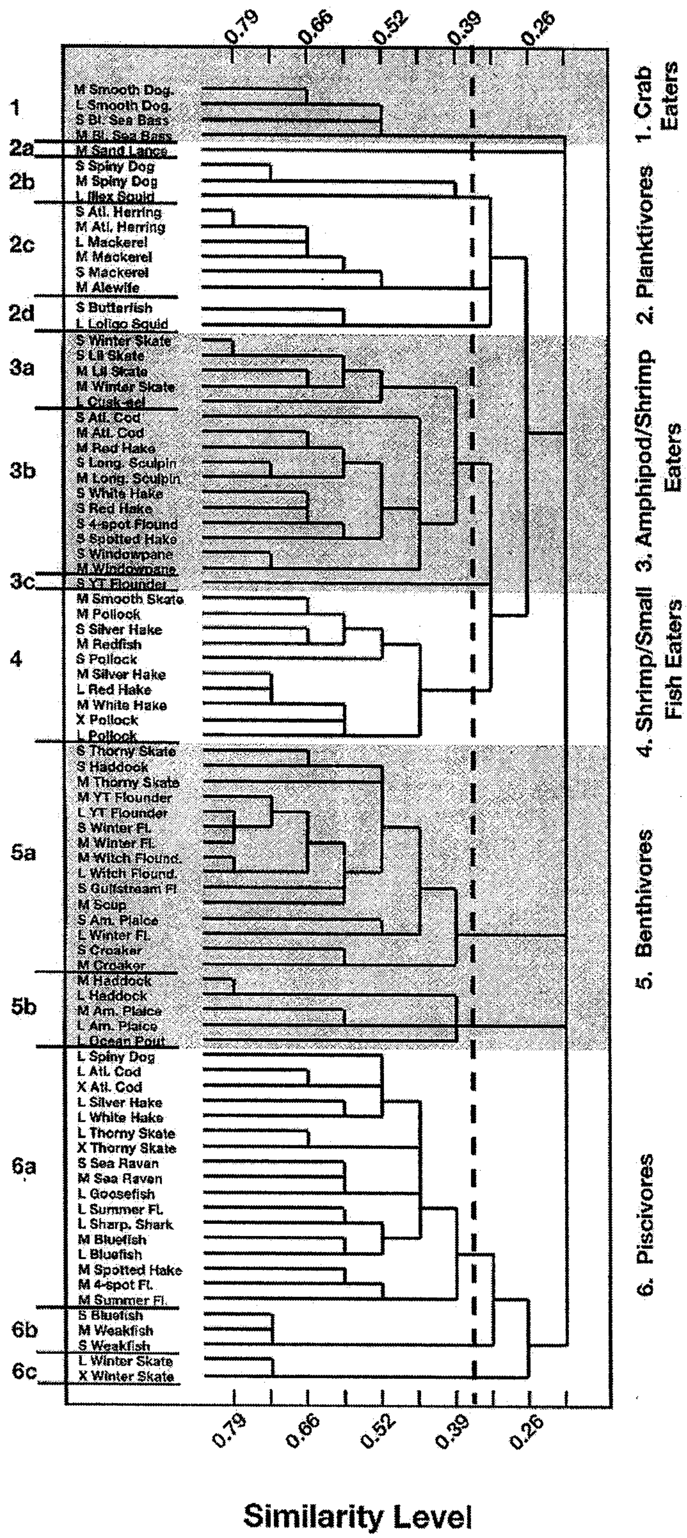


Figure 23- Dietary guild structure of Northeast finfish species

5.1.5 Predator/Prey relationships

5.1.5.1 Predators

Based on information summarized in "Bigelow and Schroeder's Fishes of the Gulf of Maine, 3rd Ed." , Collette and Klein-MacPhee, editors, adult monkfish appear to have few predators, although on occasion adult monkfish have been observed in the stomachs of other monkfish. Small monkfish are eaten by various predacious fish, including swordfish, sharks (dusky, sandbar, spiny dogfish and smooth dogfish), thorny skate, and monkfish.

5.1.5.2 Prey

Monkfish are opportunistic feeders with a wide range of prey species, including birds and other monkfish. The three main groups of prey are crustaceans, mollusks and fish. Fish make up the majority of prey for all sizes of monkfish, while cephalopods are only important in monfish >40cm. For small monkfish <20cm, silver hake and sand lance are major prey species. Monkfish diet also varies by region. Squid, clupeids, silver hake and American plaice were more prevalent in the diet of monkfish in the Gulf of Maine, while little skates, red hake, monkfish and sand lance are more prevalent in the diet in southern New England , according to Bigelow and Schroeder. Unpublished food habits data suggest that the composition of the diet also changes over time, perhaps in relation to the availability of prey species. Observed diets include the following species (Table 32):

LIFE STAGE	FOOD HABITS/PREY
LARVAE	Zooplankton: copepods, crustacean larvae, chaetognaths
JUVENILE	Small fish, sand lance, invertebrates such as red shrimp and squid
ADULT	Opportunistic feeders on benthic and pelagic species. Larger monkfish eat larger prey. Cannibalism occurs but at a low (insignificant) level based on 2001 commercial survey. Prey includes crustaceans, cephalopods, and fish, as well as sea birds and diving ducks. Prey species include: spiny dogfish, skates, eels, sand lance, herring, menhaden, smelt, mackerel, weakfish, cunner, black sea bass, butterfish, pufferfish, sculpin, sea raven, searobin, silver hake, tomcod, cod, haddock, hake, witch and other flounders, squid, large crustaceans and other benthic invertebrates.

Table 32 Monkfish food habits/prey species

5.1.6 Deep-sea canyons

The U.S. Atlantic coast continental shelf margin is cut by a number of submarine canyons (See Section 5.2.1.4). Two of these canyons (Oceanographer and Lydonia) will be described in more detail in this section of the FSEIS because the two habitat closures that are proposed for implementation in this amendment are located in these two canyons. The information summarized in the following two sections was extracted from Hecker et al. (1980) and Valentine et al. (1980).

A database of existing geo-referenced records for deep-sea coral records for 25 species of soft corals and sea fans of the Suborder Alcyonacea has been assembled from survey data and other sources of information (Watling and Auster, in press). A preliminary version of the database is available from the authors on a CD-ROM (Watling et al. 2003); the database is in the process of being developed with new records. Information for hard (scleractinian) corals) is also available. Distribution maps for hard and soft corals (Figure 24 and Figure 25). While no "reefs" have been found off the northeast coast of the U.S., the coral fauna is diverse. Seventeen species of hard corals are known from Cape Hatteras to the Gulf of Maine (Cairns and Chapman 2001), 71% of which occur deeper than 1000 meters. Surveys on the continental slope and in canyons south of Georges Bank recorded over 25 species of both hard and soft corals (Hecker et al. 1980, 1983; Valentine et al. 1980; Cooper et al. 1987; Hecker 1990). Most of the corals found in Lydonia and Oceanographer canyons were attached to hard substrate.

Deepwater corals are especially vulnerable to damage by fishing gear because of their often complex, branching form of growth and because many of them are extremely slow-growing (Packer et al., Draft). Growth rates of about 1-2 cm/year have been reported for *Primnoa resedaeformis* and *Desmophyllum cristagalli* (Andrews et al. 2002 and Risk et al. 2002), two species that are present in Lydonia and Oceanographer canyons (Table 33). *P. resedaeformis* colonies reach heights of 1 meter or more (Opresko 1980). At 1-2 cm/year, it would take 100-200 years to replace one of these colonies. Deep-water corals are also particularly susceptible to damage and loss caused by bottom trawling. Severe damage to reefs formed by the deepwater hard corals *Lophelia* off Norway and *Oculina* off the east coast of Florida has been documented (Fossa et al. 2002; Koenig et al. in press), but has also been reported by Krieger (2001) for a gorgonian (soft coral) in Alaska. In the Alaska study, a single trawl tow through *Primnoa* habitat landed 1000 kg of coral. Seven years later, 7 of 31 coral colonies remaining in the trawl path were missing 80-99% of their branches and boulders with corals attached had been tipped and dragged. *Primnoa* is one of the soft coral species known to be present in Lydonia and Oceanographer canyons (Table 33). Other species of coral present in these two canyons are probably equally vulnerable to bottom trawling. It can also be inferred that bottom gill nets would damage and remove corals from the bottom since they tend the bottom in the same way as longlines, which have been observed entangled in deepwater corals such as *Paragorgia* and *Primnoa* (Breeze et al. 1997; Mortensen et al., in press).

Corals provide structure for shelter seeking fishes and may enhance rates of prey capture for fish which feed on smaller organisms that also find shelter in the corals. In a study area in the Gulf of Alaska, Krieger and Wing (2002) noted that less than 1% of the boulders contained coral coral, but 85% of the large rockfish (*Sebastes* spp.) were found next to boulders with corals (i.e., *Primnoa* sp.). Data from research trawl surveys in Alaska showed rockfish was one of the most common species collected with gorgonian, cup, and hydrocorals while flounders and gadids were the most common species associated with *Gersemia*, a soft coral (Heifetz 2002). Surveys in relatively deep water (50-240 m) in the Gulf of Maine have shown that bottom habitats composed of rock outcrops and boulders with dense coral cover (*Paragorgia, Primnoa, Paramuricea*) supported an abundance of redfish, but densities were not any higher than in a boulder and cobble habitat with dense epifauna cover (sponges and cerianthid anemones) (Auster, in press). This study suggests that corals are an important habitat feature and are equivalent to other structures that provide cover for fish. The frequent occurrence of shrimp on the largest soft corals in Lydonia and Oceanographer canyons (Hecker et al. 1980) suggests that the corals also provide feeding opportunities for fish that congregate near them.

5.1.6.1 Oceanographer Canyon

Oceanographer Canyon has a mosaic of substrate types that are dependent on depth, currents, geology, relief, and biological activity. Shelf sediments are transported over the eastern rim of the canyon by the southwest drift and storm currents. Tidal currents and internal waves move sediments downcanyon along the axis and walls. The extensive exposure of outcrops (clay and boulders) indicates modern day erosional activities. The outcrops of clay and boulders are present on the canyon walls. Where exposed, the silty clay is burrowed by benthic species such as red crab and Jonah crab. The activities of these and possibly other organisms cause extensive erosion at depths between 100 to 1300 m. Bioerosion is minimal along on the rocky cliffs, in areas of sediment movement, and along the gravel pavement. Rippled, unconsolidated silt and sand are found along the canyon walls and in the axis. Large erratic boulders are present on the gently sloping upper canyon walls. Gravel up to cobble size forms a pavement throughout the northern part of the canyon and isolated patches are also found on the canyon walls and along the axis.

The fauna within the heavily graveled area is sparse but diverse and is dominated by epibenthic invertebrates and fish. In general, faunal density is low between 400 and 1600 m; however, there are high densities of brittle stars between 1600 and 1700 m. Both hard and soft corals are present at depths between 400 and 1100 m. Two gorgonians, *Paramuricea grandis* and *Acanthogorgia armata*, were the most abundant corals found in this canyon during a photographic survey conducted in 1979; other species that are known to be present are listed in Table 33. Corals are more abundant in Oceanographer Canyon than in Lydonia Canyon and substrates are more variable.

A number of federally-managed species were directly observed in Oceanographer Canyon using submersibles (see more detailed analysis in section 6.3.1.5). These include red crab, tilefish, witch flounder, redfish, silver hake, pollock, and red hake. There is also evidence that redfish use the large cerianthiid anemones found in the canyon as shelter. Northeast Fisheries Science Center (NEFSC) groundfish trawl data indicated that between 1968 and 2001, only two otter trawl tows had been taken within Oceanographer Canyon. One station, sampled in 1968, was at a mean depth of 229m. Four managed species were found at this station: little skate, thorny skate, silver hake and red hake. The station sampled in 1999 was at a mean depth of 181 m. Eight managed species were found at this station: spiny dogfish, butterfish, longfin squid, offshore hake, red hake, silver hake, pollock, and barndoor skate.

5.1.6.2 Lydonia Canyon

Lydonia Canyon has a mosaic of substrate types that are dependent on depth, currents, geology, relief, and biological activity. Silty sediments are found on the walls and flanks of Lydonia Canyon and there are also sporadic rock outcrops. Rock outcrops are more common along the axis. There are rippled silty sediments in the axisof the canyon along most of its length. There are clay and rock outcrops on the west wall and flank of the canyon. Cobbles, pebbles, and shell hash are found above 400m on the east wall and flank. There is a good deal of erosion of sediments particularly along the axis.

Faunal density is high above 400m and is dominated by anemones and the quill worm, *Hyalinoecia artifex.* Below 400 m, faunal density is low and is dominated by shrimp, and to a lesser degree by red crab and long-nosed eel. Most of the corals found in Lydonia Canyon are restricted to hard surfaces; the coral fauna is diverse and abundant. The most abundant species identified between 300 and 1100 m in the 1979 survey was *Eunephthya* (now *Capnella*) *florida.*

Other species present in this canyon are listed in Table 33.

A number of managed species were directly observed in Lydonia Canyon using submersibles. These include red crab, tilefish, witch flounder, silver hake, pollock, and red hake. NEFSC groundfish trawl data indicated that four stations within Lydonia Canyon were sampled between 1968 and 2001 (see more detailed analysis in section 6.3.1.5). Mean depths of the trawls ranged from 174 to 196 m. The data indicate that 17 managed species were caught at least once over that time period. These include redfish, American plaice, butterfish, cod, haddock, little skate, longfin squid, ocean pout, offshore hake, pollock, red hake, shortfin squid, silver hake, spiny dogfish, white hake, winter skate, and witch flounder.

Species	Oceanographer	Lydonia
Soft corals		
Anthomastus agassizii	✓	✓
Acanthogorgia armata	✓	✓
Trachythela rudis	✓	✓
Paragorgia arborea	✓	✓
Distichoptilum gracile	✓	
Primnoa resedaeformis	✓	✓
Anthothela grandiflora	✓	✓
Capnella florida	✓	✓
Capnella glomerata	✓	✓
Acanella arbuscula	✓	
Thouarella sp.	✓	
Paramuricea grandis	✓	✓
Pennatula aculeata	✓	✓
Hard corals		
Desmophyllum cristagalli		✓
Desmophyllum lymani		✓
Flabellum sp.		✓
Javanis cailleti		✓
Solenosmilla variabilis		✓

Table 33 - Species of coral known to be present in Oceanographer and Lydonia Canyons

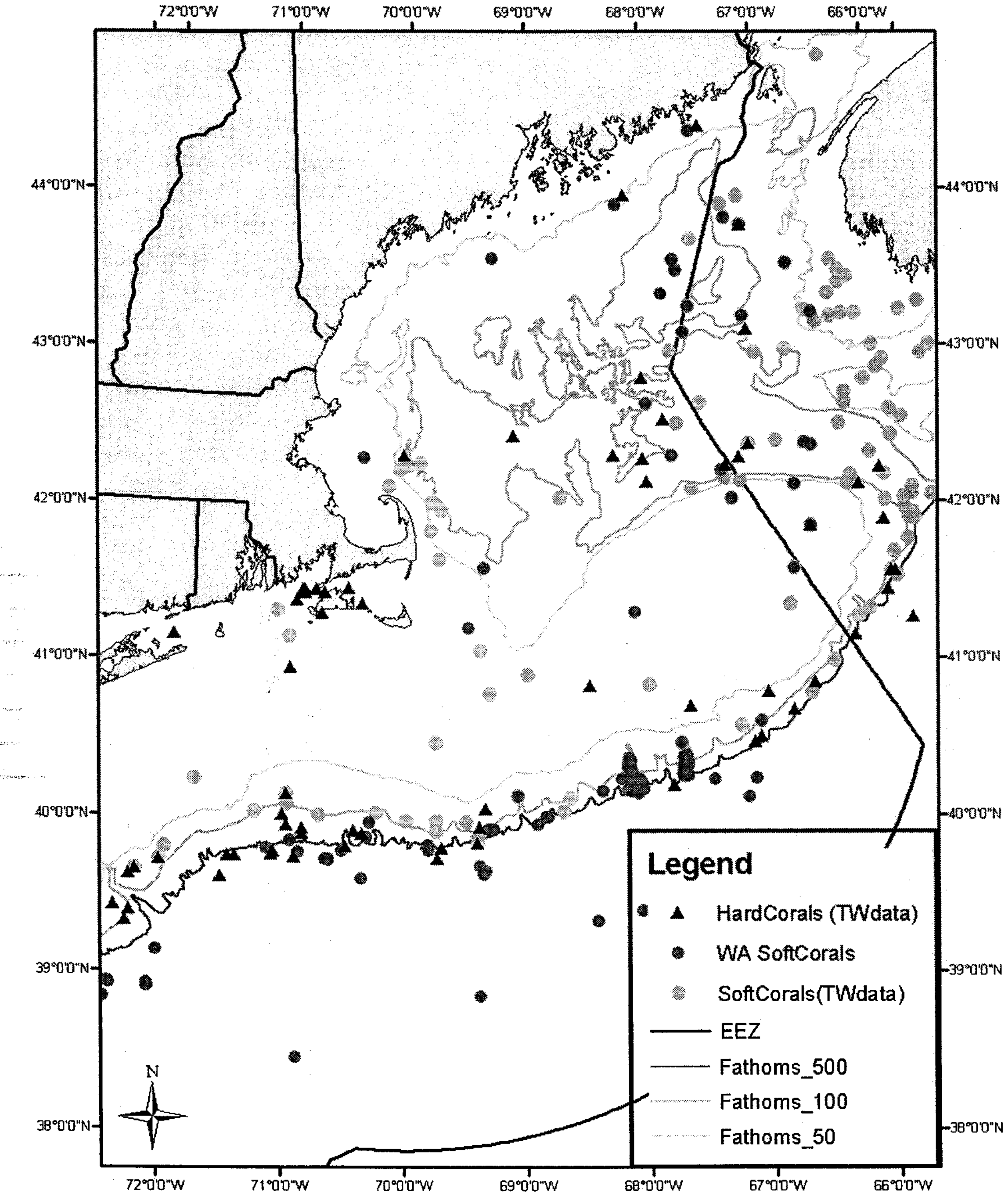


Figure 24 - Known distribution of hard and soft corals in the Gulf of Maine, Georges Bank and Southern New England area.
Source: Coral presence data based on two databases, Watling et al., 2003(WA) and Theroux and Wigley, 1998 (TW).

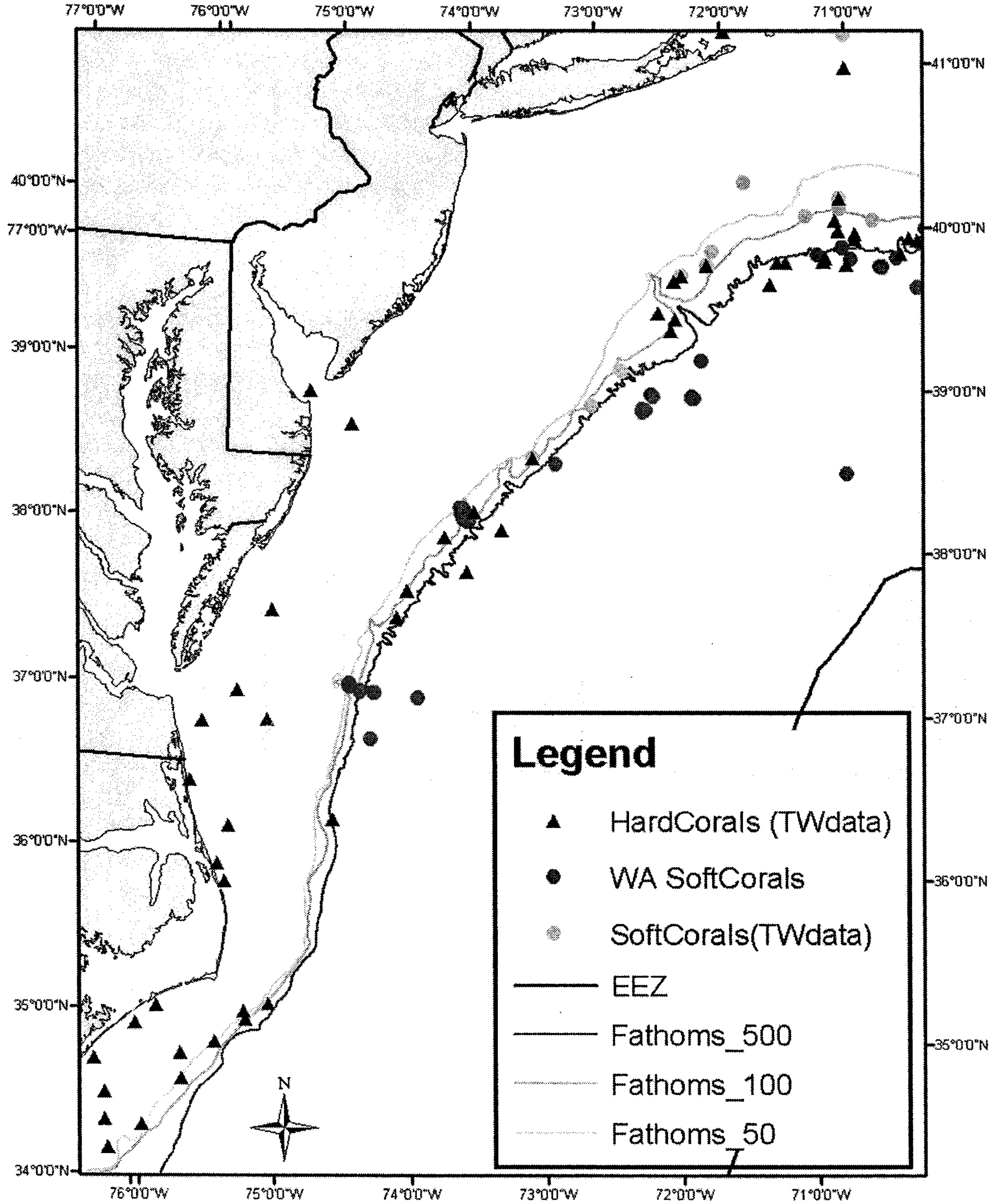


Figure 25 - Known distribution of hard and soft corals in the Mid-Atlantic area.
Source: Coral presence data based on two databases, Watling et al., 2003(WA) and Theroux and Wigley, 1998 (TW).

5.1.7 Marine Mammals and Protected Species in the Management Area

The following species are found in the area of the fisheries regulated through the Monkfish FMP and are listed under the Endangered Species Act of 1973 (ESA) as endangered, threatened, or as candidate species. The Council has also included in the list below a number of species that are identified as protected under the Marine Mammal Protection Act of 1972 (MMPA) as well as two right whale critical habitat designations that are found in the same area.

Cetaceans	
Northern right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Pilot whale (*Globicephala* spp.)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella* spp.)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected
Seals	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandica*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Barndoor skate (*Dipturus laevis*)	Candidate Species
Birds	
Roseate tern (*Sterna dougallii dougallii*)	Endangered
Piping plover (*Charadrius melodus*)	Endangered
Critical Habitat Designations	
Right whale	Cape Cod Bay Great South Channel

Although all of the protected species listed above may be found in the general geographical area covered by the Monkfish FMP, not all are affected by the fishery. Some species may inhabit areas other than those in which the fishery is prosecuted, prefer a different depth or temperature zone, or may migrate through the area at times when the fishery is not in operation. In addition, certain protected species may not be vulnerable to capture or entanglement with the gear used in the fishery. Therefore, protected species are divided into two groups. The first contains those species not likely to be affected by Amendment 2 while the second group is the subject of a more detailed assessment.

5.1.7.1 Protected Species Not Likely to be Affected by the Monkfish FMP

Following a review of the current information available on the distribution and habitat needs of the endangered, threatened, and otherwise protected species listed above in relation to the action being considered, the Council considers that monkfish fishing operations and the measures proposed in Amendment 2 to the Monkfish FMP unlikely to affect the shortnose sturgeon *(Acipenser brevirostrum*), the Gulf of Maine distinct population segment (DPS) of Atlantic salmon (*Salmo salar*), or the hawksbill sea turtle (*Eretmochelys imbricata*), all of which are species listed under the ESA.

Additionally, there are several cetaceans protected under the MMPA that are found in the action area: Risso's dolphin (*Grampus griseus*), spotted and striped dolphins (*Stenella* spp.), and coastal forms of Atlantic bottlenose dolphin (*Tursiops truncatus*). Although these species may occasionally become entangled or entrapped in certain fishing gear such as pelagic longline and mid-water trawls, these gear types are not used in the monkfish fishery.

The Council also believes that monkfish fishing operations will not adversely affect the right whale critical habitat areas listed above.

Shortnose Sturgeon

The shortnose sturgeon is benthic fish that mainly occupies the deep channel sections of several Atlantic coast rivers. They can be found in most major river systems from St. Johns River, Florida to the Saint John River in New Brunswick, Canada. The species is considered truly anadromous in the southern portion of its range (*i.e.*, south of Chesapeake Bay). However, they spend the majority of their life history within the fresh water sections of the northern rivers with only occasional forays into salt water, and are thus considered to be "freshwater amphidromous" (NMFS 1998a). There have been no documented cases of shortnose sturgeon taken in gear used in the monkfish fishery.

The monkfish fishery in Northeast and Mid-Atlantic may extend to shallow waters, but not into the intertidal zone of major river systems where shortnose sturgeon are likely to be found. Therefore, there appears to be adequate separation between the two species making it highly unlikely that the monkfish fisheries will affect shortnose sturgeon.

Atlantic Salmon

The wild populations of Atlantic salmon found in rivers and streams from the lower Kennebec River north to the U.S.-Canada border are listed as endangered. These rivers include the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers and Cove

Brook. Atlantic salmon are an anadromous species with spawning and juvenile rearing occurring in freshwater rivers followed by migration to the marine environment.

Juvenile salmon in New England rivers typically migrate to sea in May after a two to three year period of development in freshwater streams, and remain at sea for two winters before returning to their U.S. natal rivers to spawn from mid October through early November. While at sea, salmon generally undergo an extensive northward migration to waters off Canada and Greenland. Historical commercial harvest data indicate that post-smolts overwinter in the southern Labrador Sea and in the Bay of Fundy. The numbers of wild Atlantic salmon that return to these rivers are perilously small, with total run sizes of approximately 150 spawners occurring in 1999 (Baum 2000).

Capture of Atlantic salmon has occurred in U.S. commercial fisheries or by research/survey vessels, although none have been documented since 1992. No monkfish landings have been recorded for the areas adjacent to the Atlantic salmon rivers. In addition, NMFS fishery research surveys have not found monkfish in the nearshore regions adjacent to the Atlantic salmon rivers, nor does the monkfish fishery operate in or near the rivers where concentrations of Atlantic salmon are most likely to be found.

Hawksbill Sea Turtle

The hawksbill turtle is relatively uncommon in the action area. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America where they feed primarily on a wide variety of sponges and mollusks. There are accounts of small hawksbills stranded as far north as Cape Cod, Massachusetts. Many of these strandings, however, were observed after hurricanes or offshore storms. No takes of hawksbill sea turtles have been recorded in Northeast or Mid-Atlantic fisheries where observers have been deployed in the otter trawl (including the Mid-Atlantic) and sink gillnet fisheries that catch multispecies and also participate in the monkfish fishery.

Hawksbills may occur in the southern range of the action area (i.e., North Carolina and South Carolina), but their distribution is not known to overlap significantly with monkfish fishing activity. It is unlikely, therefore, that interactions between hawksbill sea turtles and vessels that catch monkfish will occur.

Right Whale Critical Habitat

Critical habitat for right whales has been designated for Cape Cod Bay, Great South Channel, and coastal Florida and Georgia (outside of the action area for this action). Cape Cod Bay and the Great South Channel areas were designated critical habitat for right whales due to their importance as spring/summer foraging grounds for this species. There is no evidence to suggest that operation of the monkfish fishery adversely affects the value of critical habitat designated for the right whale. Right whale critical habitat, therefore, is not discussed further in this document.

5.1.7.2 Protected Species Potentially Affected by this FMP

The status of the various ESA-listed species affected by the monkfish fishery is described in the Biological Opinions prepared by the National Marine Fisheries Service, beginning in 1998. The most recent Opinions are dated May 14, 2002 and April 14, 2003. The information provided in these documents on the status of species listed as endangered, threatened, or candidate species is incorporated herein by reference. Information on protected species that are potentially affected by the monkfish fishery is provided below.

Right Whale

Right whales were found historically in all the world's oceans within the temperate to subarctic latitudes. There are three major subdivisions of right whales: North Pacific, North Atlantic, and Southern Hemisphere; with eastern and western subunits found in the North Atlantic (Perry et al. 1999). Because of our limited understanding of the genetic structure of the species, the conservative approach to conservation of this species has been to treat the subunits as separate groups whose survival and recovery is critical to the health of the species.

The northern right whale has the highest risk of extinction of all large whales. Scarcity of right whales is the result of an 800-year history of whaling that continued into the 1960s (Klumov 1962). Records indicate that right whales were subject to commercial whaling in the North Atlantic as early as 1059, with an estimated 25,000-40,000 right whales believed to have been taken between the 11th and 17th centuries. The size of the western North Atlantic right whale population at the termination of whaling is unknown. The stock was first recognized as seriously depleted as early as 1750. However, right whales continued to be taken in shore-based operations or opportunistically by whalers in search of other species as late as the 1920s. By the time the species was internationally protected in 1935 there may have been fewer than 100 North Atlantic right whales in the western North Atlantic (Hain 1975; Reeves et al. 1992; Kenney et al. 1995).

Intense whaling was also the cause of the critically endangered status of the North Pacific right whale. Currently, the North Pacific population is so small that no reliable estimate can be given. In the Atlantic, the eastern subpopulation of the North Atlantic population may already be extinct. The fact that the western North Atlantic subpopulation is the most numerous right whale population in the northern hemisphere, and is only estimated to number approximately 300 animals, is testimony to the severely depleted status of this species in the northern hemisphere. In contrast, the southern right whale is recovering with a growth rate of 7% in many areas.

Right whales appear to prefer shallow coastal waters, but their distribution is also strongly correlated to zooplankton prey distribution (Winn et al. 1986). In both northern and southern hemispheres, right whales are observed in the lower latitudes and more coastal waters during winter, where calving takes place, and then migrate to higher latitudes during the summer. In the western North Atlantic, they are found west of the Gulf Stream and are most commonly associated with cooler waters (<21° C). They are not found in the Caribbean and have been recorded only rarely in the Gulf of Mexico.

NMFS designated three right whale critical habitat areas on June 3, 1994 (59 FR 28793) to help protect important right whale foraging and calving areas within the U.S. These areas are: Cape Cod Bay; the Great South Channel (both off Massachusetts); and the waters adjacent to the southern Georgia and northern Florida coast. In 1993, Canada's Department of Fisheries declared two conservation areas for right whales; one in the Grand Manan Basin in the lower

Bay of Fundy, and a second in Roseway Basin between Browns and Baccaro Banks (Canadian Recovery Plan for the North Atlantic Right Whale 2000).

Right whales feed on zooplankton through the water column, and in shallow waters may feed near the bottom. In the Gulf of Maine, they have been observed feeding primarily on copepods, by skimming at or below the water's surface with open mouths (NMFS 1991b; Kenney et al. 1986; Murison and Gaskin 1989; and Mayo and Marx 1990). Research suggests that right whales must locate and exploit extremely dense patches of zooplankton to feed efficiently (Waring et al. 2001). New England waters include important foraging habitat for right whales and at least some portion of the right whale population is present in these waters throughout most months of the year. They are most abundant in Cape Cod Bay between February and April (Hamilton and Mayo 1990; Schevill et al. 1986; Watkins and Schevill 1982) and in the Great South Channel in May and June (Kenney et al. 1986; Payne et al. 1990) where they have been observed feeding predominantly on copepods, largely of the genera *Calanus* and *Pseudocalanus* (Waring et al. 2001). Right whales also frequent Stellwagen Bank and Jeffrey's Ledge, as well as Canadian waters including the Bay of Fundy and Browns and Baccaro Banks, in the spring and summer months. Mid-Atlantic waters are used as a migratory pathway from the spring and summer feeding/nursery areas to the winter calving grounds off the coast of Georgia and Florida.

However, much about right whale movements and habitat use are still unknown. Approximately 85% of the population is unaccounted for during the winter (Waring et al. 2001). Radio and satellite tagging has been used to track right whales, and has shown lengthy and somewhat distant excursions into deep water off the continental shelf (Mate et al. 1997). In addition photographs of identified individuals have documented movements of the western North Atlantic right whales as far north as Newfoundland, the Labrador Basin and southeast of Greenland (Knowlton et al. 1992). Sixteen satellite tags were attached to right whales in the Bay of Fundy, Canada, during summer 2000 in an effort to further elucidate the movements and important habitat for North Atlantic right whales. The movements of these whales varied, with some remaining in the tagging area and others making periodic excursions to other areas before returning to the Bay of Fundy. Several individuals were observed to move along the coastal waters of Maine, while others traveled to the Scotian Shelf off Nova Scotia. One individual was successfully tracked throughout the fall, and was followed on her migration to the Georgia/Florida wintering area.

Recognizing the precarious status of the right whale, the continued threats present in its coastal habitat throughout its range, and the uncertainty surrounding attempts to characterize population trends, the International Whaling Commission (IWC) held a special meeting of its Scientific Committee from March 19-25, 1998, in Cape Town, South Africa, to conduct a comprehensive assessment of right whales worldwide. The workshop's participants reviewed available information on the North Atlantic right whale. The conclusions of Caswell et al. (1999) were particularly alarming. Using data on reproduction and survival through 1996, Caswell determined that the western North Atlantic right whale population was declining at a rate of 2.4% per year, with one model suggesting that the mortality rate of the right whale population had increased five-fold in less than one generation. According to Caswell, if the mortality rate as of 1996 does not decrease and the population's reproductive performance does not improve, extinction could occur in 191 years and would be certain within 400 years.

The IWC Workshop participants expressed "considerable concern" in general for the status of the western North Atlantic right whales. This concern was based on recent (1993-1995) observations of near-failure of calf production, the significantly high mortality rate, and an observed increase in the calving interval. It was suggested that the slow but steady recovery rate published in Knowlton et al. (1994) may not be continuing. Workshop participants urgently recommended increased efforts to reduce the human-caused mortality factors affecting this right whale population.

As stated in the IWC Workshop, there is been concern over the decline in birth rate. In the three calving seasons following Caswell's analysis, only 10 calves are known to have been born into the population, with only one known right whale birth in the 1999/2000 season. However, the 2000/2001 calving season had 31 right whale calves sighted, with 27 surviving. Although these births are encouraging, biologists recognize that there may be some additional natural mortality with the 2000/2001 calves and cautious optimism is necessary because of how close the species is to extinction. In addition, efforts to reduce human-caused mortality must be accelerated if these individuals are to survive to sexual maturity and help reverse the population decline.

One question that has repeatedly arisen regarding the western North Atlantic population of right whales is the effect that "bottlenecking" may have played on the genetic integrity of right whales. Several genetics studies have attempted to examine the genetic diversity of right whales. Results from a study by Schaeff et al. (1997) indicate that North Atlantic right whales are less genetically diverse than southern right whales; a separate population that numbers at least four times as many animals with an annual growth rate of nearly seven percent. A recent study compared the genetic diversity of North Atlantic right whales with the genetic diversity of southern right whales. The researchers found only five distinct haplotypes (a maternal genetic marker) exist amongst 180 different North Atlantic right whales sampled, versus 10 haplotypes among just 16 southern right whales sampled. In addition, one of the five haplotypes found in the North Atlantic right whales was observed in only four animals; all males born prior to 1982 (Malik et al. 2000). Because this genetic marker can be passed only from female to offspring, there is an expectation that it will be lost from the population. Two interesting facts about this haplotype are: (1) the last known female with this type was the animal killed by the shore fishery at Amagansett, Long Island in 1907; and (2) this haplotype is basal to all others worldwide (i.e., it is the most ancient of all right whales).

Low genetic diversity is a general concern for wildlife populations. It has been suggested that North Atlantic right whales have been at a low population size for hundreds of years and, while the present population exhibits very low genetic diversity, the major effects of harmful genes are thought to have occurred well in the past, effectively eliminating those genes from the population (Kenney 2000). To determine how long North Atlantic right whales have exhibited such low genetic diversity, researchers have analyzed DNA extracted from museum specimens. Rosenbaum et al. (2000) found these samples represented four different haplotypes, all of which are still present in the current population, suggesting there has not been a significant loss of genetic diversity within the last 191 years. Although his sample size (n=6) was small, it supports the theory that significant reduction in genetic diversity likely occurred prior to the late 19th century.

The role of contaminants or biotoxins in reducing right whale reproduction has also been raised. Contaminant studies have confirmed that right whales are exposed to and accumulate contaminants, but the effect that such contaminants might be having on right whale reproduction or survivability is unknown.

Competition for food resources is another possible factor impacting right whale reproduction. Researchers have found that North Atlantic right whales appear to have thinner blubber than right whales from the South Atlantic (Kenney, 2000). It has also been suggested that oceanic conditions affecting the concentration of copepods may in turn have an effect on right whales since they rely on dense concentrations of copepods to feed efficiently (Kenney 2000). However, evidence is lacking to demonstrate either that a decline in birth rate is related to depleted food resources or that there is a relationship between oceanic conditions and copepod abundance to right whale fitness and reproduction rates.

<u>General Human Impacts and Entanglement</u>

Right whales may be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including the operation of commercial fisheries. However, the major known sources of anthropogenic mortality and injury of right whales clearly are ship strikes and entanglement in commercial fishing gear such as the sink gillnet gear used to catch multispecies.

Based on photographs of catalogued animals from 1959 and 1989, Kraus (1990) estimated that 57% of right whales exhibited scars from entanglement and 7% from ship strikes (propeller injuries). Hamilton et al. (1998) updated this work using data from 1935 through 1995. The new study estimated that 61.6% of right whales exhibit injuries caused by entanglement, and 6.4% exhibit signs of injury from vessel strikes. These data may be misleading, as a ship strike may be less of a "recoverable" event than entanglement in rope. It is also known that several whales have apparently been entangled on more than one occasion, and that some right whales that have been entangled were subsequently involved in ship strikes. Furthermore, these numbers are based on sightings of free-swimming animals that initially survive the entanglement or ship strike. Therefore, the actual number of interactions may be higher as some animals are likely drowned or killed immediately, and the carcass never recovered or observed.

The most recent data describing the observed entanglements of right whales is found in Table 34. It should be noted that no information is currently available on the response of the right whale population to recent (1997-1999) efforts to mitigate the effects of entanglement and ship strikes. However, as noted above, both entanglements and ship strikes have continued to occur. Therefore, it is not possible to determine whether the trend through 1996, as reported by Caswell, is continuing. Furthermore, results reported by Caswell suggest that it is not possible to determine that anthropogenic mortalities alone are responsible for the decline in right whale survival. However, the IWC concluded that reduction of anthropogenic mortalities would significantly improve the species' survival probability.

The best available information makes it reasonable to conclude that the current death rate exceeds the birth rate in the western North Atlantic right whale population. The nearly complete reproductive failure in this population from 1993 to 1995 and again in 1998 and 1999 suggests that this pattern has continued for almost a decade. Because no population can sustain a high death rate and low birth rate indefinitely, this combination places the North Atlantic right whale population at high risk of extinction. The one bright spot is the 2000/2001 calving season that is the most promising in the past 5 years in terms of calves born. However, these young animals must be provided with protection so that they can mature and contribute to future generations in order to be a factor in stabilizing of the population.

SPECIES	Right		Humpback		Fin		Minke		TOTAL	
	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive
1997										
Gillnet	0	1	0	0	0	2	0	0	0	3
Pot/Trap	0	2	0	1	0	1	0	2	0	6
UNK/Other	0	1	0	1	0	0	0	0	0	2
TOTAL	**0**	**4**	**0**	**2**	**0**	**3**	**0**	**2**	**0**	**11**
1998										
Gillnet	0	0	1	4	0	0	1	0	2	4
Pot/Trap	0	2	0	1	0	0	0	0	0	3
UNK/Other	0	1	0	0	0	0	0	1	0	2
TOTAL	**0**	**3**	**1**	**5**	**0**	**0**	**1**	**1**	**2**	**9**
1999										
Gillnet	1	0	0	2	0	0	0	0	1	2
Pot/Trap	0	2	0	1	0	1	0	1	0	5
UNK/Other	0	1	0	1	0	0	2	0	2	2
TOTAL	**1**	**3**	**0**	**4**	**0**	**1**	**2**	**1**	**3**	**9**
2000										
Gillnet	0	0	0	2	0	0	0	0	0	2
Pot/Trap	0	0	0	0	0	0	0	2	0	2
UNK/Other	0	2	0	1	0	0	0	0	0	3
TOTAL	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**7**
2001										
Gillnet	0	0	1	1	0	0	0	0	1	1
Pot/Trap	0	1	0	1	0	0	0	0	0	2
UNK/Other	1	1	0	1	0	0	0	0	1	2
TOTAL	**1**	**2**	**1**	**3**	**0**	**0**	**0**	**0**	**2**	**5**
TOTAL ALL	**2**	**14**	**2**	**17**	**0**	**4**	**3**	**6**	**7**	**41**

Table 34 Large Whale Entanglements, 1997-2001*

* Data from NMFS entanglement reports where some gear was recovered and/or observed allowing experts to attempt to ID gear. Other entanglement records exist but gear was not recovered or observed.

Humpback Whale

Humpback whales calve and mate in the West Indies and migrate to feeding areas in the northwestern Atlantic during the summer months. Six separate feeding areas are utilized in northern waters (Waring et al. 2001). Only one of these feeding areas, the Gulf of Maine, lies within U.S. waters contained within the management unit of the FMP (Northeast Region). Most of the humpbacks that forage in the Gulf of Maine visit Stellwagen Bank and the waters of Massachusetts and Cape Cod Bays. Sightings are most frequent from mid-March through November between 41° N and 43° N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge (CeTAP 1982), and peak in May and August. However, small numbers of individuals may be present in this area year-round. They feed on a number of species of small schooling fishes, particularly sand lance and Atlantic herring, by filtering large amounts of water through their baleen to capture prey (Wynne and Schwartz 1999).

Data from a photographic identification catalogue of over 600 individual humpback whales have described the majority of the habitats used by this species (Barlow and Clapham 1997; Clapham et al. 1999). The photographic data have identified that reproductively mature western North Atlantic humpbacks winter in tropical breeding grounds in the Antilles, primarily on Silver and Navidad Banks north of the Dominican Republic. The primary winter range where calving and copulation is believed to take place also includes the Virgin Islands and Puerto Rico (NMFS 1991a). Calves are born from December through March and are about 4 meters at birth. Sexually mature females give birth approximately every 2 to 3 years. Sexual maturity is reached between 4 and 6 years of age for females and between 7 and 15 years for males. Size at maturity is about 12 meters.

Humpback whales use the mid-Atlantic as a migratory pathway. However, observations of juvenile humpbacks since 1989 in the mid-Atlantic have been increasing during the winter months, peaking January through March (Swingle et al. 1993). Biologists theorize that non-reproductive animals may be establishing a winter-feeding range in the mid-Atlantic since they are not participating in reproductive behavior in the Caribbean. The whales using this mid-Atlantic area were found to be residents of the Gulf of Maine and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups, suggesting a mixing of different feeding stocks in the mid-Atlantic region. Strandings and entanglements of humpback whales have increased between New Jersey and Florida during the same period (Wiley et al. 1995).

New information has become available on the status and trends of the humpback whale population in the North Atlantic that indicates the population is increasing. However, it has not yet been determined whether this increase is uniform across all six feeding stocks (Waring et al. 2001). For example, although the overall rate of increase has been estimated at 9.0% (CV=0.25) by Katona and Beard (1990), Barlow and Clapham (1997) reported a 6.5% rate through 1991 for the Gulf of Maine feeding group.

A variety of methods have been used to estimate the North Atlantic humpback whale population. However, the photographic mark-recapture analyses from the Years of the North Atlantic Humpback (YONAH) project gave a North Atlantic basin-wide estimate of 10,600 (95% c.i. = 9,300 - 12,100) is regarded as the best available estimate for that population.

General Human Impacts and Entanglement

The major known sources of anthropogenic mortality and injury of humpback whales include entanglement in commercial fishing gear such as the sink gillnet gear used to catch multispecies, and ship strikes. Based on photographs of the caudal peduncle of humpback whales, Robbins and Mattila (1999) estimated that between 48% and 78% of animals in the Gulf of Maine exhibit scarring caused by entanglement. Several whales have apparently been entangled on more than one occasion. These estimates are based on sightings of free-swimming animals that initially survive the encounter. The most recent data describing the observed entanglements of humpback whales is found in Table 64. Because some whales may drown immediately, the actual number of interactions may be higher. In addition, the actual number of species-gear interactions is contingent on the intensity of observations from aerial and ship surveys.

Humpback whales may also be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including the operation of commercial fisheries.

Fin Whale

Fin whales inhabit a wide range of latitudes between 20-75° N and 20-75° S (Perry et al. 1999). Fin whales spend the summer feeding in the relatively high latitudes of both hemispheres, particularly along the cold eastern boundary currents in the North Atlantic and North Pacific Oceans and in Antarctic waters (IWC 1992). Most migrate seasonally from relatively high-latitude Arctic and Antarctic feeding areas in the summer to relatively low-latitude breeding and calving areas in the winter (Perry et al. 1999).

As was the case for the right and humpback whales, fin whale populations were heavily affected by commercial whaling. However, commercial exploitation of fin whales occurred much later than for right and humpback whales. Wide-scale commercial exploitation of fin whales did not occur until the 20th century when the use of steam power and harpoon- gun technology made exploitation of this faster, more offshore species feasible. In the southern hemisphere, over 700,000 fin whales were landed in the 20th century. More than 48,000 fin whales were taken in the North Atlantic between 1860 and 1970 (Perry et al. 1999). Fisheries existed off of Newfoundland, Nova Scotia, Norway, Iceland, the Faroe Islands, Svalbard (Spitsbergen), the islands of the British coasts, Spain and Portugal. Fin whales were rarely taken in U.S. waters, except when they ventured near the shores of Provincetown, MA, during the late 1800's (Perry et al. 1999).

In the North Atlantic today, fin whales are widespread and occur from the Gulf of Mexico and Mediterranean Sea northward to the edges of the arctic pack ice (NMFS 1998b). A number of researchers have suggested the existence of fin whale subpopulations in the North Atlantic. Mizroch et al. (1984) suggested that local depletions resulting from commercial over harvesting supported the existence of North Atlantic fin whale subpopulations. Others have used genetic information to support the existence of multiple subpopulations of fin whales in the North Atlantic and Mediterranean (Bérubé et al. 1998). Although the IWC's Scientific Committee proposed seven stocks for North Atlantic fin whales, it is uncertain whether these stock boundaries define biologically isolated units (Waring et al. 2001). NMFS has designated one stock of fin whale for U.S. waters of the North Atlantic (Waring et al. 2001) where the species is commonly found from Cape Hatteras northward.

Various estimates have been provided to describe the current status of fin whales in western North Atlantic waters. Based on the history and trends of whaling catch, an estimate of 3,590 to 6,300 fin whales was obtained for the entire western North Atlantic (Perry et al. 1999). Hain et al. (1992) estimated that about 5,000 fin whales inhabit the Northeastern United States continental shelf waters. The latest published SAR (Waring et al. 2002) gives a best estimate of abundance for fin whales of 2,814 (CV = 0.21). However, this is considered an underestimate, as too little is known about population structure, and the estimate is derived from surveys over a limited portion of the western North Atlantic. There is also not enough information to estimate population trends.

Despite our broad knowledge of fin whales, less is known about their life history as compared to right and humpback whales. Age at sexual maturity for both sexes ranges from 5-15 years. Physical maturity is reached at 20-30 years. Conception occurs during a 5 month winter period in either hemisphere. After a 12-month gestation, a single calf is born. The calf is weaned between 6 and 11 months after birth. The mean calving interval is 2.7 years, with a range of between 2 and 3 years (Agler et al. 1993). Like right and humpback whales, fin whales are believed to use western North Atlantic waters primarily for feeding and migrate to more southern waters for calving. However, the overall pattern of fin whale movement consists of a less obvious north-south pattern of migration than that of right and humpback whales.

Based on acoustic recordings from hydrophone arrays, Clark (1995) reported the fin whale as the most acoustically common whale species heard in the North Atlantic and described a general pattern of fin whale movements in the fall from the Labrador/Newfoundland region, south past Bermuda, and into the West Indies. However, evidence regarding where the majority of fin whales winter, calve, and mate is still scarce.

The overall distribution of fin whales may be based on prey availability. This species preys opportunistically on both zooplankton and fish (Watkins et al. 1984). The predominant prey of fin whales varies greatly in different geographical areas depending on what is locally available. In the western North Atlantic fin whales feed on a variety of small schooling fish (i.e., herring, capelin, sand lance) as well as squid and planktonic crustaceans (Wynne and Schwartz 1999). As with humpback whales, fin whales feed by filtering large volumes of water for their prey through their baleen plates. Photo identification studies in western North Atlantic feeding areas, particularly in Massachusetts Bay, have shown a high rate of annual return by fin whales, both within years and between years (Seipt et al. 1990).

As discussed above, fin whales were the focus of commercial whaling, primarily in the 20th century. The IWC did not begin to manage commercial whaling of fin whales in the North Atlantic until 1976 and were not given total protection until 1987, with the exception of a subsistence whaling hunt for Greenland. In total, there have been 239 reported kills of fin whales from the North Atlantic from 1988 to 1995.

General Human Impacts and Entanglement

The major known sources of anthropogenic mortality and injury of fin whales include ship strikes and entanglement in commercial fishing gear such as the sink gillnet gear used to catch multispecies. However, many of the reports of mortality cannot be attributed to a particular source. Of 18 fin whale mortality records collected between 1991 and 1995, four were associated with vessel interactions, although the true cause of mortality was not known. Although several fin whales have been observed entangled in fishing gear, (see Table 64) with some being disentangled, no mortalities have been attributed to gear entanglement.

In general, known mortalities of fin whales are less than those recorded for right and humpback whales. This may be due in part to the more offshore distribution of fin whales where they are either less likely to encounter entangling gear, or are less likely to be noticed when gear entanglements or vessel strikes do occur. Fin whales may also be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources due to trophic effects resulting from a variety of activities including the operation of commercial fisheries.

Sei Whale

Sei whales are a widespread species in the world's temperate, subpolar and subtropical and even tropical marine waters. However, they appear to be more restricted to temperate waters than other balaenopterids (Perry et al. 1999). The IWC recognized three stocks in the North Atlantic based on past whaling operations: (1) Nova Scotia; (2) Iceland Denmark Strait; (3) Northeast Atlantic (Donovan 1991 *in* Perry et al. 1999). Mitchell and Chapman (1977) suggested that the sei whale population in the western North Atlantic consists of two stocks, a Nova Scotian Shelf stock and a Labrador Sea stock. The Nova Scotian Shelf stock includes the continental shelf waters of the Northeast Region, and extends northeastward to south of Newfoundland. The IWC boundaries for this stock are from the U.S. east coast to Cape Breton, Nova Scotia and east to 42°W longitude (Waring et al. 2001). This is the only sei whale stock within the management unit of this FMP.

Sei whales became the target of modern commercial whalers primarily in the late 19^{th} and early 20^{th} century after stocks of other whales, including right, humpback, fin and blues, had already been depleted. Sei whales were taken in large numbers by Norway and Scotland from the beginning of modern whaling (NMFS 1998b). Small numbers were also taken off of Spain, Portugal, and West Greenland from the 1920's to 1950's (Perry et al. 1999). In the western North Atlantic, a total of 825 sei whales were taken on the Scotian Shelf between 1966-1972, and an additional 16 were by a shore-based Newfoundland whaling station (Perry et al. 1999). The species continued to be exploited in Iceland until 1986 even though measures to stop whaling of sei whales in other areas had been put into place in the 1970s (Perry et al. 1999). There is no estimate for the abundance of sei whales prior to commercial whaling. Based on whaling records, approximately14,295 sei whales were taken in the entire North Atlantic from 1885 to 1984 (Perry et al. 1999).

Sei whales winter in warm temperate or subtropical waters and summer in more northern latitudes. In the North Atlantic, most births occur in November and December when the whales are on the wintering grounds. Conception is believed to occur in December and January. Gestation lasts for 12 months and the calf is weaned at 6-9 months when the whales are on the summer feeding grounds (NMFS 1998b). Sei whales reach sexual maturity at 5-15 years of age. The calving interval is believed to be 2-3 years (Perry et al. 1999).

Sei whales occur in deep water throughout their range, typically over the continental slope or in basins situated between banks (NMFS 1998b). In the northwest Atlantic, the whales travel along the eastern Canadian coast in autumn on their way to and from the Gulf of Maine and Georges Bank where they occur in winter and spring. Within the Northeast Region, the sei whale is most common on Georges Bank and into the Gulf of Maine/Bay of Fundy region during spring and summer. Individuals may range as far south as North Carolina. It is important to note that sei whales are known for inhabiting an area for weeks at a time then disappearing for year or even decades. This has been observed all over the world, including in the southwestern Gulf of Maine in 1986, but the basis for this phenomenon is not clear.

Although sei whales may prey upon small schooling fish and squid in the Northeast Region, available information suggests that calanoid zooplankton are the primary prey of this species. There are occasional influxes of sei whales further into Gulf of Maine waters, presumably in conjunction with years of high copepod abundance inshore. Sei whales are occasionally seen feeding in association with right whales in the southern Gulf of Maine and in the Bay of Fundy, although there is no evidence of interspecific competition for food resources. There is very little information on natural mortality factors for sei whales. Possible causes of natural mortality, particularly for young, old or otherwise compromised individuals are shark attacks, killer whale attacks, and endoparasitic helminthes (Perry et al. 1999).

There are insufficient data to determine trends of the sei whale population. Because there are no abundance estimates within the last 10 years, a minimum population estimate cannot be determined for management purposes (Waring et al. 2001). Abundance surveys are problematic because this species is difficult to distinguish from the fin whale and too little is known of the sei whale's distribution, population structure and patterns of movement.

General Human Impacts and Entanglement

No instances of injury or mortality of sei whales due to entanglements in fishing gear have been recorded in U.S. waters, possibly because sei whales typically inhabit waters further offshore than most commercial fishing operations, or perhaps entanglements do occur but are less likely to be observed. However, due to the overlap of this species observed range with the monkfish fishery areas that use sink gillnet gear, the potential for entanglement does exist. As noted in Waring, et al. (2002), sei whale movements into inshore areas have occurred historically. Similar impacts noted above for other baleen whales may also occur. Due to the deep-water distribution of this species, interactions that do occur are less likely to be observed or reported than those involving right, humpback, and fin whales that often frequent areas within the continental shelf.

Blue Whale

Like the fin whale, blue whales occur worldwide and are believed to follow a similar migration pattern from northern summering grounds to more southern wintering areas (Perry et al. 1999). Three subspecies have been identified: *Balaenoptera musculus musculus, B.m. intermedia*, and *B.m. brevicauda* (NMFS 1998c). Only *B. musculus* occurs in the northern hemisphere. Blue whales range in the North Atlantic from the subtropics to Baffin Bay and the Greenland Sea. The IWC currently recognizes these whales as one stock (Perry et al. 1999).

Blue whales were intensively hunted in all of the world's oceans from the turn of the century to the mid-1960's when development of steam-powered vessels and deck-mounted harpoon guns in the late 19th century made it possible to exploit them on an industrial scale (NMFS 1998c). Blue whale populations declined worldwide as the new technology spread and began to receive widespread use (Perry et al. 1999). Subsequently, the whaling industry shifted effort away from declining blue whale stocks and targeted other large species, such as fin whales, and then resumed hunting for blue whales when the species appeared to be more abundant (Perry et al. 1999). The result was a cyclical rise and fall, leading to severe depletion of blue whale stocks worldwide (Perry et al. 1999). In all, at least 11,000 blue whales were taken in the North Atlantic from the late 19th century through the mid-20th century.

Blue whales were given complete protection in the North Atlantic in 1955 under the International Convention for the Regulation of Whaling. There are no good estimates of the pre-exploitation size of the western North Atlantic blue whale stock but it is widely believed that this stock was severely depleted by the time legal protection was introduced in 1955 (Perry et al. 1999). Mitchell (1974) suggested that the stock numbered in the very low hundreds during the late 1960's through early 1970's (Perry et al. 1999). Photo-identification studies of blue whales in the Gulf of St. Lawrence from 1979 to 1995 identified 320 individual whales (NMFS 1998c). The NMFS recognizes a minimum population estimate of 308 blue whales within the Northeast Region (Waring et al. 2001).

Blue whales are only occasional visitors to east coast U.S. waters. They are more commonly found in Canadian waters, particularly the Gulf of St. Lawrence where they are present for most of the year, and in other areas of the North Atlantic. It is assumed that blue whale distribution is governed largely by food requirements (NMFS 1998c). In the Gulf of St. Lawrence, blue whales appear to predominantly feed on several copepod species (NMFS 1998c).

Compared to the other species of large whales, relatively little is known about this species. Sexual maturity is believed to occur in both sexes at 5-15 years of age. Gestation lasts 10-12 months and calves nurse for 6-7 months. The average calving interval is estimated to be 2-3 years. Birth and mating both take place in the winter season (NMFS 1998c), but the location of wintering areas is speculative (Perry et al. 1999). In 1992 the U.S. Navy and contractors conducted an extensive blue whale acoustic survey of the North Atlantic and found concentrations of blue whales on the Grand Banks and west of the British Isles. One whale was tracked for 43 days during which time it traveled 1,400 nautical miles around the general area of Bermuda (Perry et al. 1999).

There is limited information on the factors affecting natural mortality of blue whales in the North Atlantic. Ice entrapment is known to kill and seriously injure some blue whales during late winter and early spring, particularly along the southwest coast of Newfoundland. Habitat degradation has been suggested as possibly affecting blue whales such as in the St. Lawrence River and the Gulf of St. Lawrence where habitat has been degraded by acoustic and chemical pollution. However, there is no data to confirm that blue whales have been affected by such habitat changes (Perry et al. 1999).

General Human Impacts and Entanglement

Entanglements in fishing gear such as the sink gillnet gear used in the monkfishfishery and ship strikes are believed to be the major sources of anthropogenic mortality and injury of blue whales. However, confirmed deaths or serious injuries are few. NOAA Fisheries 2003 Biological Opinion for the monkfish fishery references an incident in 1987, when, concurrent with an unusual influx of blue whales into the Gulf of Maine, one report was received from a whale watch boat that spotted a blue whale in the southern Gulf of Maine entangled in gear described as probable lobster pot gear. A second animal found in the Gulf of St. Lawrence apparently died from the effects of an entanglement.

Sperm Whale

Sperm whales inhabit all ocean basins, from equatorial waters to the polar regions (Perry et al. 1999). In the western North Atlantic they range from Greenland to the Gulf of Mexico and the Caribbean. The sperm whales that occur in the western North Atlantic are believed to represent only a portion of the total stock (Blaylock et al. 1995). Total numbers of sperm whales off the USA or Canadian Atlantic coast are unknown, although eight estimates from selected regions of the habitat do exist for select time periods. The best estimate of abundance for the North Atlantic stock of sperm whales is 4,702 (CV=0.36) (Waring et al. 2001). The IWC recognizes one stock for the entire North Atlantic (Waring et al. 2001).

The IWC estimates that nearly a quarter-million sperm whales were killed worldwide in whaling activities between 1800 and 1900 (IWC 1971). With the advent of modern whaling the larger rorqual whales were targeted. However as their numbers decreased, whaling pressure again focused on smaller rorquals and sperm whales. From 1910 to 1982 there were nearly 700,000 sperm whales killed worldwide from whaling activities (Clarke 1954). Some sperm whales were also taken off the U.S. Mid-Atlantic coast (Reeves and Mitchell 1988; Perry et al. 1999), and in the northern Gulf of Mexico (Perry et al. 1999). Recorded North Atlantic sperm whale catch numbers for Canada and Norway from 1904 to 1972 total 1,995. All killing of sperm whales was banned by the IWC in 1988.

Sperm whales generally occur in waters greater than 180 meters in depth with a preference for continental margins, seamounts, and areas of upwelling, where food is abundant (Leatherwood and Reeves 1983). Sperm whales in both hemispheres migrate to higher latitudes in the summer for feeding and return to lower latitude waters in the winter where mating and calving occur. Mature males typically range to higher latitudes than mature females and immature animals but return to the lower latitudes in the winter to breed (Perry et al. 1999). Waring et al. (1993) suggest sperm whale distribution is closely correlated with the Gulf Stream edge with a migration to higher latitudes during summer months where they are concentrated east and northeast of Cape Hatteras. Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the mid-Atlantic Bight (Waring et al. 2001).

Mature females in the northern hemisphere ovulate April through August. A single calf is born after a 15-month gestation. A mature female will produce a calf every 4-6 years. Females attain sexual maturity at a mean age of nine years, while males have a prolonged puberty and attain sexual maturity at about age 20 (Waring et al. 2001). Male sperm whales may not reach physical maturity until they are 45 years old (Waring et al. 2001). The sperm whales prey consists of larger mid-water squid and fish species (Perry et al. 1999). Sperm whales, especially mature males in higher latitude waters, have been observed to take significant quantities of large demersal and deep water sharks, multispecies, and bony fishes.

General Human Impacts and Entanglement

Few instances of injury or mortality of sperm whales due to human impacts have been recorded in U.S. waters. Because of their generally more offshore distribution and their benthic feeding habits, sperm whales are less subject to entanglement than are right or humpback whales. However, the monkfish fishery is conducted near the shelf edge and utilizes fixed sink gillnet gear that may pose a threat to sperm whales.

Documented takes primarily involve offshore fisheries such as the offshore lobster pot fishery and pelagic driftnet and pelagic longline fisheries. Ships also strike sperm whales. Due to the offshore distribution of this species, interactions (both ship strikes and entanglements) that do occur are less likely to be reported than those involving right, humpback, and fin whales that more often occur in nearshore areas. Other impacts noted above for baleen whales may also occur.

Leatherback Sea Turtle

Leatherback turtles are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour 1972). The leatherback sea turtle is the largest living turtle and ranges farther than any other sea turtle species, exhibiting broad thermal tolerances that allow it to forage into the colder Northeast Region waters (NMFS and USFWS, 1995). Evidence from tag returns and strandings in the western North Atlantic suggests that adults engage in routine migrations between boreal, temperate and tropical waters (NMFS and USFWS, 1992). In the U.S., leatherback turtles are found throughout the western North Atlantic during the warmer months along the continental shelf, and near the Gulf Stream edge. A 1979 aerial survey of the outer Continental Shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia showed leatherbacks to be present throughout the area with the most numerous sightings made from the Gulf of Maine south to Long Island (CeTAP 1982). Shoop and Kenney (1992) also observed concentrations of leatherbacks during the summer off the south shore of Long Island and New Jersey. Leatherbacks in these waters are thought to be following their preferred jellyfish prey.

Compared to the current knowledge regarding loggerhead populations, the genetic distinctness of leatherback populations is less clear. However, genetic analyses of leatherbacks to date indicate female turtles nesting in St. Croix/Puerto Rico and those nesting in Trinidad differ from each other and from turtles nesting in Florida, French Guiana/Suriname and along the South African Indian Ocean coast. Since populations or subpopulations of leatherback sea turtles have not been formally recognized, the conservative approach is to treat leatherback nesting populations as distinct.

Leatherbacks are predominantly a pelagic species and feed on jellyfish and other soft-body prey. Time-depth-recorder data collected by Eckert et al. (1996) indicate that leatherbacks are night feeders and are deep divers, with recorded dives to depths in excess of 1,000 meters. However, leatherbacks may feed in shallow waters if there is an abundance of jellyfish near shore. For example, leatherbacks occur annually in shallow bays such as Cape Cod and Narragansett Bays during the fall.

Leatherbacks are a long lived species (> 30 years), with an estimated age at sexual maturity reported as about 13-14 years for females, and an estimated minimum age at sexual maturity of 5-6 years, with (Zug and Parham 1996 and NMFS 2001). Leatherbacks nest from March through July and produce 100 eggs or more in each clutch, or a total of 700 eggs or more per nesting season (Schultz 1975). The eggs will incubate for 55-75 days before hatching. The habitat requirements for post-hatchling leatherbacks that reach the ocean are virtually unknown (NMFS and USFWS 1992).

Status and Trends of Leatherback Sea Turtles

Estimated to number approximately 115,000 adult females globally in 1980 (Pritchard 1982) and only 34,500 by 1995 (Spotila et al. 1996), leatherback populations have been decimated worldwide, not only by fishery related mortality but, at least historically, primarily due to exploitation of eggs (Ross 1979). On some beaches nearly 100% of the eggs laid have been harvested (Eckert 1996).

Data collected in southeast Florida clearly indicate increasing numbers of nests over the past twenty years (9.1-11.5% increase), although it is critical to note that there was also an increase in the survey area in Florida over time (NOAA Fisheries SEFSC 2001). The largest leatherback rookery in the western Atlantic remains along the northern coast of South America in French Guiana and Suriname. More than half of the present world leatherback population is estimated to be nesting on the beaches in and close to the Marowijne River Estuary in Suriname and French Guiana (Hilterman and Goverse 2004). Nest numbers in Suriname have shown an increase and the long-term trend for the Suriname and French Guiana nesting group seems to show an increase. In 2001, the number of nests for Suriname and French Guiana combined was 60,000, one of the highest numbers observed for this region in 35 years. Studies by Girondot, et al. (in review) also suggest that the trend for the Suriname-French Guiana nesting population over the last 36 years is stable or slightly increasing.

General Human Impacts and Entanglement

Anthropogenic impacts to the leatherback population include fishery interactions as well as exploitation of the eggs (Ross 1979). Eckert (1996) and Spotila et al. (1996) record that adult mortality has also increased significantly, particularly as a result of driftnet and longline fisheries. Zug and Parham (1996) attribute the sharp decline in leatherback populations to the combination of the loss of long-lived adults in fishery related mortality, and the lack of recruitment stemming from elimination of annual influxes of hatchlings because of egg harvesting.

Poaching is not known to be a problem for U.S. nesting populations. However, numerous fisheries that occur in both U.S. state and federal waters are known to negatively impact juvenile and adult leatherback sea turtles. These include incidental take in several commercial and recreational fisheries. Fisheries known or suspected to incidentally capture leatherbacks include those deploying bottom trawls, off-bottom trawls, purse seines, bottom longlines, hook and line, gill nets, drift nets, traps, haul seines, pound nets, beach seines, and surface longlines (NMFS and USFWS 1992).

Leatherback interactions with the southeast shrimp fishery, which operates from North Carolina through southeast Florida (NOAA Fisheries 2002), are also common. The National Research Council Committee on Sea Turtle Conservation identified incidental capture in shrimp trawls as the major anthropogenic cause of sea turtle mortality (NRC 1999). Leatherbacks are likely to encounter shrimp trawls working in the coastal waters off the Atlantic coast (from Cape Canaveral, Florida through North Carolina) as they make their annual spring migration north. For many years, TEDs that were required for use in the southeast shrimp fishery were less effective for leatherbacks, compared to the smaller, hard-shelled turtle species, because the TED openings were too small to allow leatherbacks to escape. To address this problem, on February 21, 2003, NOAA Fisheries issued a final rule to amend the TED regulations. Modifications to the design of TEDs are now required in order to exclude leatherbacks as well as large benthic immature and sexually mature loggerhead and green turtles.

Leatherbacks are also susceptible to entanglement in lobster and crab pot gear. The probable reasons may be: attraction to gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface; attraction to the buoys which could appear as prey; or the gear configuration which may be more likely to wrap around flippers. The total number of leatherbacks reported entangled from New York through Maine from all sources for the years 1980 - 2000 is 119. Entanglements are also common in Canadian waters where Goff and Lien (1988) reported that 14 of 20 leatherbacks encountered off the coast of Newfoundland/Labrador were entangled in fishing gear including salmon net, herring net, gillnet, trawl line and crab pot line. Prescott (1988) reviewed stranding data for Cape Cod Bay and concluded that for those turtles where cause of death could be determined (the minority), entanglement in fishing gear is the leading cause of death followed by capture by dragger, cold stunning, or collision with boats.

As noted, there are many human-related sources of mortality to leatherbacks. A tally of all leatherback takes anticipated annually under current biological opinions was projected to be as many as 801 leatherback takes, although this sum includes many takes expected to be non-lethal.

Leatherbacks have a number of pressures on their populations, including injury or mortality in fisheries, other federal activities (e.g., military activities, oil and gas development, etc.), degradation of nesting habitats, direct harvest of eggs, juvenile and adult turtles, the effects of ocean pollutants and debris, lethal collisions, and natural disturbances such as hurricanes that are capable of destroying nesting beaches. Spotila et al. (1996) conclude, "stable leatherback populations could not withstand an increase in adult mortality above natural background levels without decreasing the Atlantic population is the most robust, but it is being exploited at a rate that cannot be sustained and if this rate of mortality continues, these populations will also decline."

Kemp's Ridley Sea Turtle

The Kemp's ridley is the most endangered of the world's sea turtle species. Of the world's seven extant species of sea turtles, the Kemp's ridley has declined to the lowest population level. Kemp's ridleys nest in daytime aggregations known as arribadas, primarily on a stretch of beach in Mexico called Rancho Nuevo. Most of the population of adult females nest in this single locality (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963).

By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid-1980s.

Status and Trends of Kemp's Ridley Sea Turtles

The TEWG (1998; 2000) indicated that the Kemp's ridley population appears to be in the early stage of exponential expansion. Nesting data, estimated number of adults, and percentage of first time nesters have all increased from lows experienced in the 1970s and 1980s. From 1985 to 1999, the number of nests observed at Rancho Nuevo and nearby beaches has increased at a mean rate of 11.3% per year, allowing cautious optimism that the population is on its way to recovery. For example, nesting data indicated that the number of adults declined from a population that produced 6,000 nests in 1966 to a population that produced 924 nests in 1978 and 702 nests in 1985 then increased to produce 1,940 nests in 1995. Estimates of adult abundance followed a similar trend from an estimate of 9,600 in 1966 to 1,050 in 1985 and 3,000 in 1995. The increased recruitment of new adults is illustrated in the proportion of neophyte, or first time nesters, which has increased from 6% to 28% from 1981 to 1989 and from 23% to 41% from 1990 to 1994.

Kemp's ridley nesting occurs from April through July each year. Little is known about mating but it is believed to occur before the nesting season in the vicinity of the nesting beach. Hatchlings emerge after 45-58 days. Once they leave the beach, neonates presumably enter the Gulf of Mexico where they feed on available sargassum and associated infauna or other epipelagic species (USFWS and NMFS, 1992). Ogren (1988) suggests that the Gulf coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico. However, at least some juveniles will travel northward as water temperatures warm to feed in productive coastal waters off Georgia through New England (USFWS and NMFS, 1992).

Juvenile Kemp's ridleys use northeastern and Mid-Atlantic coastal waters of the U.S. Atlantic coastline as primary developmental habitat during summer months, with shallow coastal embayments serving as important foraging grounds. Ridleys found in Mid- Atlantic waters are primarily post-pelagic juveniles averaging 40 centimeters in carapace length, and weighing less than 20 kilograms (Terwilliger and Musick 1995). Next to loggerheads, they are the second most abundant sea turtle in Virginia and Maryland waters, arriving in these areas during May and June (Keinath et al., 1987; Musick and Limpus, 1997). Studies have found that post-pelagic ridleys feed primarily on a variety of species of crabs. Mollusks, shrimp, and fish are consumed less frequently (Bjorndal, 1997).

With the onset of winter and the decline of water temperatures, ridleys migrate to more southerly waters from September to November (Keinath et al., 1987; Musick and Limpus, 1997). Turtles who do not head south soon enough face the risks of cold stunning in northern waters. Cold stunning can be a significant natural cause of mortality for sea turtles in Cape Cod Bay and Long Island Sound. For example, in the winter of 1999/2000, there was a major cold-stunning event where 218 Kemp's ridleys, 54 loggerheads, and 5 green turtles were found on Cape Cod beaches. The severity of cold stun events depends on: the numbers of turtles utilizing Northeast waters in a given year; oceanographic conditions; and the occurrence of storm events in the late fall. Cold-stunned turtles have also been found on beaches in New York and New Jersey. Cold-stunning events can represent a significant cause of natural mortality, in spite of the fact that many cold-stun turtles can survive if found early enough.

General Human Impacts and Entanglement

Like other turtle species, the severe decline in the Kemp's ridley population appears to have been heavily influenced by a combination of exploitation of eggs and impacts from fishery interactions. From the 1940s through the early 1960s, nests from Ranch Nuevo were heavily exploited (USFWS and NMFS, 1992), but beach protection in 1966 helped to curtail this activity (USFWS and NMFS, 1992). Currently, anthropogenic impacts to the Kemp's ridley population are similar to those discussed above for other sea turtle species. Takes of Kemp's ridley turtles have been recorded by sea sampling coverage in the Northeast otter trawl fishery, pelagic longline fishery, and southeast shrimp and summer flounder bottom trawl fisheries.

Kemp's ridleys may also be affected by large-mesh gillnet fisheries. In the spring of 2000, a total of five Kemp's ridley carcasses were recovered from a North Carolina beach where 277 loggerhead carcasses were found. Cause of death for most of the turtles recovered was unknown, but the mass mortality event was suspected to have been from a large-mesh gillnet fishery operating offshore in the preceding weeks. It is possible that strandings of Kemp's ridley turtles in some years have increased at rates higher than the rate of increase in the Kemp's ridley population (TEWG 1998).

Green Sea Turtle

Green turtles are distributed circumglobally. In the western Atlantic they range from Massachusetts to Argentina, including the Gulf of Mexico and Caribbean, but are considered rare north of Cape Hatteras (Wynne and Schwartz, 1999). Most green turtle nesting in the continental United States occurs on the Atlantic Coast of Florida (Ehrhart 1979). Green turtles were traditionally highly prized for their flesh, fat, eggs, and shell, and directed fisheries in the United States and throughout the Caribbean are largely to blame for the decline of the species. In the Gulf of Mexico, green turtles were once abundant enough in the shallow bays and lagoons to support a commercial fishery. However, declines in the turtle fishery throughout the Gulf of Mexico were evident by 1902 (Doughty 1984).

In the continental United States, green turtle nesting occurs on the Atlantic coast of Florida (Ehrhart 1979). Occasional nesting has been documented along the Gulf coast of Florida, at southwest Florida beaches, as well as the beaches on the Florida panhandle (Meylan et al., 1995). The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the ten years of regular monitoring, perhaps due to increased protective legislation throughout the Caribbean (Meylan et al., 1995). Increased nesting has also been observed along the Atlantic Coast of Florida, on beaches where only loggerhead nesting was observed in the past). Recent population estimates for the western Atlantic area are not available.

While nesting activity is obviously important in determining population distributions, the remaining portion of the green turtle's life is spent on the foraging and breeding grounds. Juvenile green sea turtles occupy pelagic habitats after leaving the nesting beach. Pelagic juveniles are assumed to be omnivorous, but with a strong tendency toward carnivory during early life stages. At approximately 20 to 25 cm carapace length, juveniles leave pelagic habitats and enter benthic foraging areas, shifting to a chiefly herbivorous diet (Bjorndal 1997). Green turtles appear to prefer marine grasses and algae in shallow bays, lagoons and reefs (Rebel 1974) but also consume jellyfish, salps, and sponges.

As is the case for loggerhead and Kemp's ridley sea turtles, green sea turtles use mid-Atlantic and northern areas of the western Atlantic coast as important summer developmental habitat. Green turtles are found in estuarine and coastal waters as far north as Long Island Sound, Chesapeake Bay, and North Carolina sounds (Musick and Limpus 1997). Like loggerheads and Kemp's ridleys, green sea turtles that use northern waters during the summer must return to warmer waters when water temperatures drop, or face the risk of cold stunning. Cold stunning of green turtles may occur in southern areas as well (*i.e.*, Indian River, Florida), as these natural mortality events are dependent on water temperatures and not solely geographical location.

General Human Impacts and Entanglement

Anthropogenic impacts to the green sea turtle population are similar to those discussed above for other sea turtles species. As with the other species, fishery mortality accounts for a large proportion of annual human-caused mortality outside the nesting beaches, while other activities like dredging, pollution, and habitat destruction account for an unknown level of other mortality. Sea sampling coverage in the pelagic driftnet, pelagic longline, scallop dredge, southeast shrimp trawl, and summer flounder bottom trawl fisheries has recorded takes of green turtles.

Loggerhead Sea Turtle

Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans in a wide range of habitats. These include open ocean, continental shelves, bays, lagoons, and estuaries (NMFS and USFWS 1995). Loggerhead sea turtles are primarily benthic feeders, opportunistically foraging on crustaceans and mollusks (Wynne and Schwartz 1999). Under certain conditions they may also scavenge fish (NMFS and USFWS 1991b). Horseshoe crabs are known to be a favorite prey item in the Chesapeake Bay area (Lutcavage and Musick 1985).

Status and Trends of Loggerhead Sea Turtles

The loggerhead sea turtle was listed as threatened under the ESA on July 28, 1978. The species was considered to be a single population in the North Atlantic at the time of listing. However, further genetic analyses conducted at nesting sites indicate the existence of five distinct subpopulations ranging from North Carolina, south along the Florida east coast and around the keys into the Gulf of Mexico, to nesting sites in the Yucatan peninsula and Dry Tortugas (TEWG 2000 and NMFS SEFSC 2001). Natal homing to those nesting beaches is believed to provide the genetic barrier between these nesting aggregations, preventing recolonization from turtles from other nesting beaches.

The threatened loggerhead sea turtle is the most abundant of the sea turtles listed as threatened or endangered in the U.S. waters. In the western North Atlantic, most loggerhead sea turtles nest from North Carolina to Florida and along the gulf coast of Florida. The southeastern U.S. nesting aggregation is the second largest and represents about 35 % of the nests of this species. The total number of nests along the U.S. Atlantic and Gulf coasts between 1989 and 1998, ranged from 53,014 to 92,182 annually, with a mean of 73,751. Since a female often lays multiple nests in any one season, the average adult female population was estimated to be 44,780 (Murphy and Hopkins 1984).

However, the status of the northern loggerhead subpopulation is of particular concern. Based on the above, there are only an estimated 3,800 nesting females in the northern loggerhead subpopulation, and the status of this northern population based on number of loggerhead nests, has been classified declining or stable (TEWG 2000). Another factor that may add to the vulnerability of the northern subpopulation is that genetics data show that the northern subpopulation produces predominantly males (65%). In contrast, the much larger south Florida subpopulation produces predominantly females (80%) (NMFS SEFSC 2001).

The activity of the loggerhead is limited by temperature. Loggerheads commonly occur throughout the inner continental shelf from Florida through Cape Cod, Massachusetts. Loggerheads may also occur as far north as Nova Scotia when oceanographic and prey conditions are favorable. Surveys conducted offshore as well as sea turtle stranding data collected during November and December off North Carolina suggest that sea turtles emigrating from northern waters in fall and winter months may concentrate in nearshore and southerly areas influenced by warmer Gulf Stream waters (Epperly et al. 1995). This is supported by the collected work of Morreale and Standora (1998) who tracked 12 loggerheads and 3 Kemp's ridleys by satellite. All of the turtles followed similar spatial and temporal corridors, migrating south from Long Island Sound, New York, during October through December. The turtles traveled within a narrow band along the continental shelf and became sedentary for one or two months south of Cape Hatteras.

Loggerhead sea turtles do not usually appear on the most northern summer foraging grounds in the Gulf of Maine until June, but are found in Virginia as early as April. They remain in the mid-Atlantic and northeast areas until as late as November and December in some cases, but the majority leaves the Gulf of Maine by mid-September. Aerial surveys of loggerhead turtles north of Cape Hatteras indicate that they are most common in waters from 22 to 49 meters deep, although they range from the beach to waters beyond the continental shelf (Shoop and Kenney 1992).

All five loggerhead subpopulations are subject to natural phenomena that cause annual fluctuations in the number of young produced. For example, there is a significant overlap between hurricane seasons in the Caribbean Sea and northwest Atlantic Ocean (June to November), and the loggerhead sea turtle nesting season (March to November). Sand accretion and rainfall that result from these storms as well as wave action can appreciably reduce hatchling success. In 1992, Hurricane Andrew affected turtle nests over a 90-mile length of coastal Florida; all of the eggs were destroyed by storm surges on beaches that were closest to the eye of this hurricane (Milton et al. 1994). Other sources of natural mortality include cold stunning and biotoxin exposure.

General Human Impacts and Entanglement

The diversity of the sea turtles life history leaves them susceptible to many human impacts, including impacts on land, in the benthic environment, and in the pelagic environment. Anthropogenic factors that impact the success of nesting and hatching include: beach erosion, beach armoring and nourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; beach driving; coastal construction and fishing piers; exotic dune and beach vegetation; and poaching. An increased human presence at some nesting beaches or close to nesting beaches has led to secondary threats such as the introduction of exotic fire ants, and an increased presence of native species (e.g., raccoons, armadillos, and opossums) which raid and feed on turtle eggs.

Loggerhead sea turtles originating from the western Atlantic nesting aggregations are believed to lead a pelagic existence in the North Atlantic gyre for as long as 7-12 years before settling into benthic environments. Loggerhead sea turtles are impacted by a completely different set of threats from human activity once they migrate to the ocean. During that period, they are exposed to a series of long-line fisheries that include the U.S. Atlantic tuna and swordfish longline fisheries, an Azorean long-line fleet, a Spanish long-line fleet, and various fleets in the Mediterranean Sea (Aguilar et al. 1995, Bolten et al. 1994, Crouse 1999). Observer records indicate that, of the 6,544 loggerheads estimated to be captured by the U.S. Atlantic tuna and swordfish longline fleet between 1992-1998, an estimated 43 were dead (Yeung 1999). For 1998, alone, an estimated 510 loggerheads (225-1250) were captured in the longline fishery. Aguilar et al. (1995) estimated that the Spanish swordfish longline fleet, which is only one of the many fleets operating in the region, captures more than 20,000 juvenile loggerheads annually (killing as many as 10,700).

Once loggerheads enter the benthic environment in waters off the coastal U.S., they are exposed to a suite of fisheries in federal and State waters including trawl, purse seine, hook and line, gillnet, pound net, longline, and trap fisheries. Loggerhead sea turtles are captured in fixed pound net gear in the Long Island Sound, in pound net gear and trawls in summer flounder and other finfish fisheries in the Mid-Atlantic and Chesapeake Bay, in gillnet fisheries in the Mid-Atlantic and elsewhere, and in multispecies, monkfish, spiny dogfish, and northeast sink gillnet fisheries.

In addition to fishery interactions, loggerhead sea turtles also face other man-made threats in the marine environment. These include oil and gas exploration and coastal development, as well as marine pollution, underwater explosions, and hopper dredging. Offshore artificial lighting, power plant entrainment and/or impingement, and entanglement in debris or ingestion of marine debris are also seen as possible threats. Boat collisions and poaching are two direct impacts that affect loggerheads.

Barndoor Skate

Barndoor skate is considered a candidate species under the ESA as a result of two petitions to list the species as endangered or threatened that were received in March and April 1999. In June 1999, the agency declared the petitioned actions to be warranted and requested additional information on whether or not to list the species under the ESA. At the 30th Stock Assessment Workshop (SAW 30) held in November 1999, the Stock Assessment Research Committee (SARC) reviewed the status of the barndoor skate stock relative to the five listing criteria of the ESA. The SARC provided their report to the NMFS in the SAW 30 document (NEFSC 2000). NMFS published a decision on the petitions on September 27, 2002 (67FR61055-61061) that the petitioned actions are not warranted at this time. However, NMFS is leaving barndoor skate on the agency's list of candidate species due to remaining uncertainties regarding the status and population structure of the species

The barndoor skate occurs from Newfoundland, the Gulf of St. Lawrence, off Nova Scotia, the Gulf of Maine, and the northern sections of the Mid-Atlantic Bight down to North Carolina. It is one of the largest skates in the Northwest Atlantic and is presumed to be a long-lived, slow growing species. Barndoor skates inhabit mud and sand/gravel bottoms along the continental shelf, generally at depths greater than 150 meters. They are believed to feed on benthic invertebrates and fishes (Bigelow and Schroeder 1953).

The barndoor skate is often caught as a bycatch species in the offshore trawl and sink gillnet fisheries that target multispecies. When landed, barndoor skate are often used in the skate wing fishery.

The abundance of barndoor skate declined continuously through the 1960's. Since 1990, their abundance has increased slightly on Georges Bank, the western Scotian shelf, and in Southern New England, although the current NEFSC autumn survey biomass index is less than 5% of the peak observed in 1963. The species was identified as an overfished species at the SAW 30 (NEFSC 2000). Skates are sensitive to overutilization generally because of their limited reproductive capacity. This is a characteristic of all of the larger species in the Northeast skate complex that are relatively slow-growing, long-lived, and late maturing.

Minke Whale

Minke whales have a cosmopolitan distribution in polar, temperate, and tropical waters. The Canadian east coast population is one of four populations recognized in the North Atlantic. Minke whales off the eastern coast of the U.S. are considered to be part of the population that extends from Davis Strait off Newfoundland to the Gulf of Mexico. The species is common and widely distributed along the U.S. continental shelf. They show a certain seasonal distribution with spring and summer peak numbers, falling off in the fall to very low winter numbers. Like all baleen whales, the minke whale generally occupies the continental shelf proper.

Minke whales are known to be taken in sink gillnet gear that is also used to catch monkfish, although no mortalities have been recorded since 1991. Takes have also been documented in trawl fisheries. Waring et al. (2002) has described the estimated total take of minkes in all fisheries to be below the PBR established for that species.

Harbor Porpoise

Harbor porpoise are found primarily in the Gulf of Maine in the summer months. However, they migrate seasonally through regions where multispecies finfish are caught. For example, they move through the southern New England area where the multispecies fishery occurs in the spring (March and April). Harbor porpoise also move through the Massachusetts Bay and Jeffrey's Ledge region in the spring (April and May) and the fall (October November).

Harbor porpoise are taken in sink gillnet gear used to catch monkfish. The historic level of serious injury and mortality of this species in this gear was known to be high relative to the estimated population level. The Harbor Porpoise Take Reduction Plan (HPTRP) was implemented in 1998 to reduce takes in the Northeast and Mid-Atlantic gillnet fisheries, including the monkfish fishery, through a series of time/area closures and required use of acoustical deterrents that have reduced the take to acceptable levels.

NMFS recently reported (67FR51234 dated August 7, 2002) that the estimated incidental take of harbor porpoise in U.S. waters for 2001 was 80 animals. The minimum population estimate for 1999 was established at 74,695, and the potential biological removal (PBR) for the harbor porpoise is now set at 747. Although the current mortality estimate is below the latest PBR level, the stock is still considered a strategic stock requiring continued measures to reduce human-caused mortality from commercial fishing. This is due to the fact that there are insufficient data to determine population trends for this species.

Atlantic White-Sided Dolphin

White-sided dolphins are found in the temperate and sub-polar waters of the North Atlantic, primarily on the continental shelf waters out to the 100-meter depth contour. The species is distributed from central western Greenland to North Carolina, with the Gulf of Maine stock commonly found from Hudson Canyon to Georges Bank and into the Gulf of Maine to the Bay of Fundy. A minimum population estimate for the white-sided dolphin 37,904 has been derived for U.S. waters (Waring et al. 2002) from several survey estimates.

White-sided dolphins have been observed taken in sink gillnets, pelagic drift gillnets, and several mid-water and bottom trawl fisheries. While is unclear whether sink gillnets with takes of white-sided dolphins were engaged in the monkfish fishery, the inference can be made that the gear type is capable of interactions with this species. Waring et al. (2002) described the estimated total take of white-sided dolphins in all fisheries (including those that catch multispecies) to be below the PBR established for that species.

Risso's Dolphin

Risso's dolphins are distributed along the continental shelf edge of North America from Cape Hatteras to Georges Bank. A minimum population estimate of 29,110 was derived from limited survey estimates in northern U.S. waters. Observers have documented takes in the pelagic drift gillnet, pelagic longline, and mid-water trawl fisheries, but have not reported this species in monkfish gear (Waring et al. 2002), although takes have been documented in the Northeast multispecies sink gillnet fishery. Since both fisheries use similar gear, Risso's dolphin could be vulnerable to entanglement in the directed monkfish fishery, although it may be a rare occurrence. This conclusion is based on their preference for pelagic prey species (squid and schooling fishes) and because their general distribution makes encounters with monkfish gear unlikely. Therefore although takes in this fishery could occur, they should not that compromise the ability of this species to maintain optimum sustainable population levels, or cause their serious injury and mortality levels to exceed the PBR levels allowed for commercial fisheries under the MMPA.

Pantropical Spotted Dolphins

The two species of spotted dolphin in the Western North Atlantic, *Stenella frontalis* and *S. attenuata,* are difficult to differentiate at sea resulting in combined abundance estimates prior to 1998. The best estimate of abundance currently available is 13, 117. Data is insufficient to determine population trends for this species. Sightings from 1990-1998 occurred almost exclusively on the continental shelf edge and slope areas west of Georges Bank (Waring et al. 2002). While takes are documented in pelagic drift gillnet and pelagic longline gear, NOAA's *2003 MMPA List of Fisheries* lists this species as taken Northeast sink gillnet, gear that is also used in the monkfish fishery. Despite some level of interactions, the pelagic prey species of these animals and their habitat preferences make it unlikely that takes in this fishery will occur at levels that compromise their ability to maintain optimum sustainable population levels, or cause their serious injury and mortality levels to exceed the PBR levels allowed for commercial fisheries under the MMPA.

Coastal Bottlenose Dolphins

The coastal form of the bottlenose dolphin occurs in the shallow, relatively warm waters along the U.S. Atlantic coast from New Jersey to Florida and the Gulf of Mexico. They rarely range beyond the 25-meter depth contour north of Cape Hatteras. Although they are taken in coastal sink gillnet operations (bluefish, croaker, spiny and smooth dogfish, kingfish, Spanish mackerel, spot, striped bass and weakfish) these fisheries occur in the more shallow range of the coastal bottlenose dolphin. A complete list of fishery interactions is provided in Waring et al. (2002) and infers that anchored set gillnets and drift gillnets used in the monkfish fishery may take this species.

Although one or more of the management units of this stock may be depleted, at this writing all units retain the depleted designation. The stock is considered strategic under the MMPA because fishery-related mortality and serious injury exceed PBR. Because encounters generally occur inshore of the monkfish fishery, its continued operation as well as the proposed measures are not expected to affect the status of coastal bottlenose dolphins.

Pelagic Delphinids (Pilot whales, offshore bottlenose and common dolphins)

The pelagic delphinid complex is made up of small odontocete species that are broadly distributed along the continental shelf edge where depths range from 200 - 400 meters. They are commonly found in large schools feeding on schools of fish. The minimum population estimates for each species number in the tens of thousands. They are known to be taken in pelagic and sink gillnets gear as well as mid-water and bottom trawl gear. Although takes have occurred in the bottom trawl fishery and gillnet fisheries, their pelagic prey species suggest they do not forage near the bottom, making it unlikely that interactions in the monkfish fishery would compromise the ability of these species to maintain optimum sustainable population levels, or cause their serious injury and mortality levels to exceed the PBR levels allowed for commercial fisheries under the MMPA.

Harbor seal

The harbor seal is found in all nearshore waters of the Atlantic Ocean above about 30 degrees latitude (Waring et al. 2001). In the western North Atlantic they are distributed from the eastern Canadian Artic and Greenland south to southern New England and New York, and occasionally the Carolinas (Boulva and McLaren 1979; Gilbert and Guldager 1998). It is believed that the harbor seals found along the U.S. and Canadian east coasts represent one population (Waring et al. 2001). Harbor seals are year-round inhabitants of the coastal waters of eastern Canada and Maine, and occur seasonally along the southern New England and New York coasts from September through late-May. However, breeding and pupping normally occur only in waters north of the New Hampshire/Maine border. Since passage of the MMPA in 1972, the number of seals found along the New England coast has increased nearly five-fold with the number of pups seen along the Maine coast increasing at an annual rate of 12.9 percent during the 1981-1997 period (Gilbert and Guldager 1998). The minimum population estimate for the harbor seal is 30,990 based on uncorrected total counts along the Maine coast in 1997 (Waring et al. 2002).

Harbor seals are taken in sink gillnet gear used to catch monkfish. Waring et al. (2002) has described the estimated total take of harbor seals in all fisheries to be below the PBR of 1,859 established for that species.

Gray seal

The gray seal is found on both sides of the North Atlantic, with the western North Atlantic population occurring from New England to Labrador. There are two breeding concentrations in eastern Canada; one at Sable Island and one that breeds on the pack ice in the Gulf of St. Lawrence. There are several small breeding colonies on isolated islands along the coast of Maine and on outer Cape Cod and Nantucket Island in Massachusetts (Waring et al. 2001). The population estimates for the Sable Island and Gulf of St Lawrence breeding groups was 143,000 in 1993. The gray seal population in Massachusetts has increased from 2,010 in 1994 to 5,611 in 1999, although it is not clear how much of this increase may be due to animals emigrating from northern areas. Approximately 150 gray seals have been observed on isolated island off Maine.

Gray seals are taken in sink gillnet gear used to catch monkfish. Waring et al. (2002) has described the estimated total take of gray seals from 1959 to 1999 in all fisheries to be between 50 and 155 animals which is well below the PBR of 8,850 established for that species. The monkfish fishery, therefore, is not likely to adversely affect this species.

Harp seal

The harp seal occurs throughout much of the North Atlantic and Arctic Oceans, and have been increasing off the East Coast of the United States from Maine to New Jersey. Harp seals are usually found off the U.S. from January to May when the western stock of harp seals is at their most southern point of migration (Waring et al. 2002). This species congregates on the edge of the pack ice in February through April when breeding and pupping takes place. The harp seal is highly migratory, moving north and south with the edge of the pack ice. Non-breeding juveniles will migrate the farthest south in the winter, but the entire population moves north toward the Artic in the summer. The minimum population estimate for the western North Atlantic is 5.2 million seals.

A large number of harp seals are killed in Canada, Greenland and the Artic. The Canadian kill is controlled by DFO who set the allowed kill at 275,000 in 1997. Mortality in Greenland and the Artic may exceed 100,000 (Waring et al. 2002). Harp seals are also taken in sink gillnet gear used to catch multispecies. Waring et al. (2001) has described the estimated total take of harp seals from 1959 to 1999 in all fisheries to range between 78 and 694 animals depending on the location of the pack ice edge which drives the seals farther south into the range of the sink gillnet fishery. Even with the highest takes observed, the take is well below the PBR of 156,000 established for that species. .

Additional background information on the range-wide status of these species can be found in a number of published documents, including sea turtle status reviews and biological reports (NOAA Fisheries and USFWS 1995; Marine Turtle Expert Working Group (TEWG) 1998 & 2000), recovery plans for the humpback whale (NOAA Fisheries 1991a), right whale (1991b), loggerhead sea turtle (NOAA Fisheries and USFWS 1991a), Kemp's ridley sea turtle (USFWS and NOAA Fisheries 1992), green sea turtle (NOAA Fisheries and USFWS 1991b) and leatherback sea turtle (NOAA Fisheries and USFWS 1992), the Marine Mammal Stock Assessment Reports (SAR) (Waring *et al.* 2000; Waring *et al.* 2001), and other publications (*e.g.*, Perry *et al.* 1999; Clapham *et al.* 1999; IWC 2001a). A draft recovery plan for fin and sei whales is available at http://www.NOAA Fisheries.noaa.gov/prot_res/PR3/recovery.html (NOAA Fisheries 1998b, unpublished). An updated draft recovery plan for right whales (Silber and Clapham 2001) is also available at the same web address.

5.2 Physical Environment

This section contains a description of the physical environment of the Northeast monkfish fishery, including oceanographic and physical habitat conditions in the Gulf of Maine, Georges Bank, Southern New England and Mid-Atlantic regions. Some of the information presented in this section was originally included in the EA for the Omnibus EFH Amendment (NEFMC 1998a).

5.2.1 Physical Characteristics of Regional Systems

The Northeast Shelf Ecosystem (Figure 26) has been described as including the area from the Gulf of Maine south to North Carolina, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman et al. 1996). The continental slope of this region includes the area east of the shelf, out to a depth of 2000 m. A number of distinct sub-systems comprise the region, including the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another subsystem, Southern New England, is described; however, we incorporated the distinctive features of this region into the descriptions of Georges Bank and the Mid-Atlantic Bight.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley and areas of glacially rafted hard bottom.

Pertinent aspects of the physical characteristics of each of these systems are described in sections that follow. This review is based on several summary reviews (Abernathy 1989, Backus 1987, Beardsley et al. 1996, Brooks 1996, Cook 1988, Dorsey 1998, Kelley 1998, Wiebe et al. 1987, Mountain 1994, NEFMC 1998, Schmitz et al. 1987, Sherman et al. 1996, Steimle et al. 1999b, Stumpf and Biggs 1988, Townsend 1992, Tucholke 1987). Literature citations are not included for generally accepted concepts; however, new research and specific results of research findings are cited.

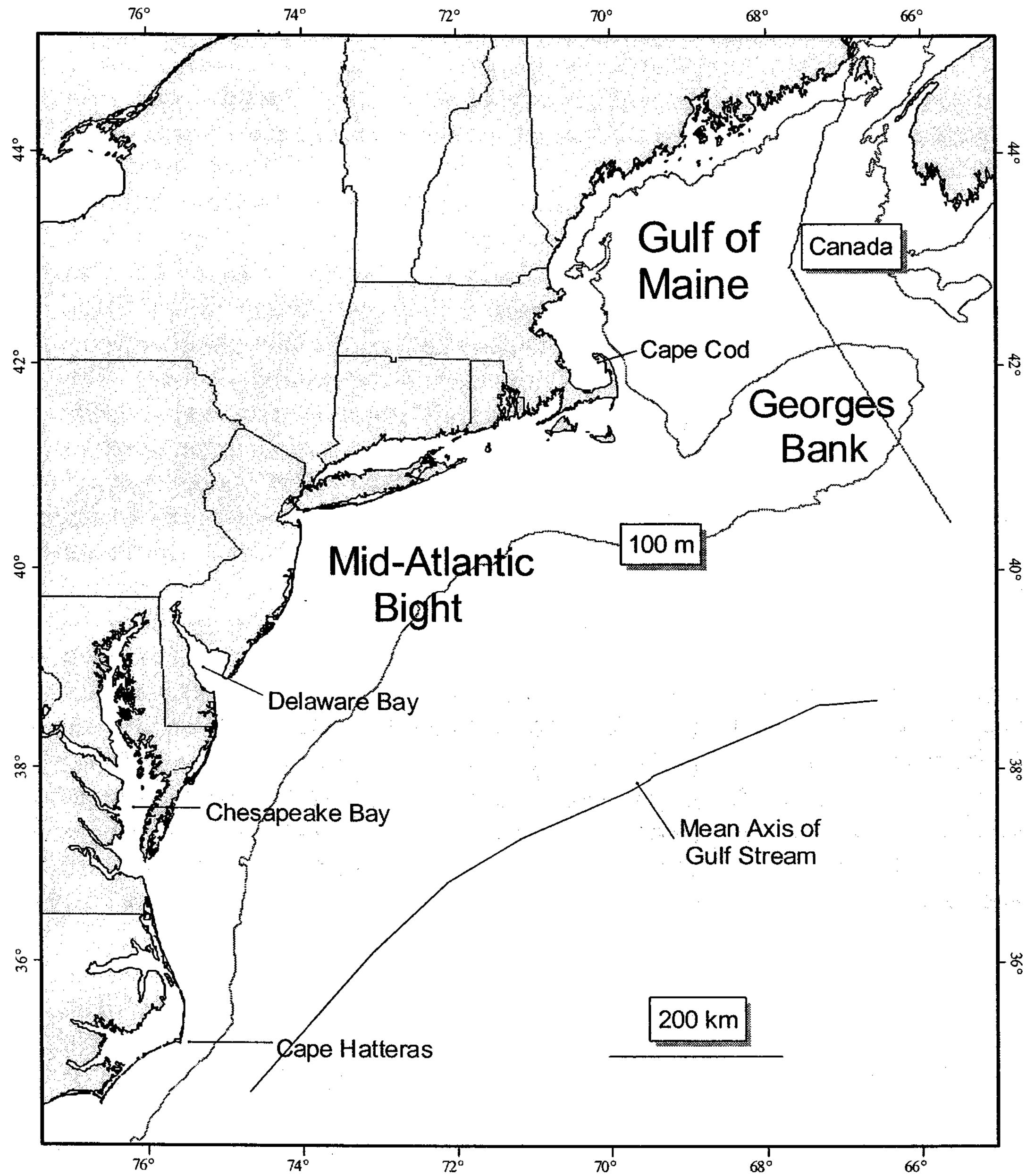


Figure 26- U.S. Northeast shelf ecosystem.

5.2.1.1 Gulf of Maine

Although not obvious in appearance, the Gulf of Maine is actually an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states and on the south by Cape Cod and Georges Bank (Figure 26). The Gulf of Maine (GOM) was glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes which result in a rich biological community.

The Gulf of Maine is topographically unlike any other part of the continental border along the U.S. east coast. It contains 21 distinct basins separated by ridges, banks, and swells. The three largest basins are Wilkinson, Georges, and Jordan. Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. The Northeast Channel between Georges Bank and Browns Bank, leads into Georges Basin, and is one of the primary avenues for exchange of water between the GOM and the North Atlantic Ocean.

High points within the GOM include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface, as well as lower flat-topped banks and gentle swells. Some of these rises are remnants of the sedimentary shelf left after the glaciers removed most of it. Others are glacial moraines and a few, like Cashes Ledge, are out-croppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the Gulf of Maine, particularly in its deep basins (Figure 27).These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. Some shallower basins are covered with mud as well, including some in coastal waters. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, as on Sewell Ridge to the north of Georges Basin and on Truxton Swell to the south of Jordan Basin. Sand predominates on some high areas and gravel, sometimes with boulders, predominates on others.

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the Gulf of Maine north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often border abruptly on rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common, but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20-40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

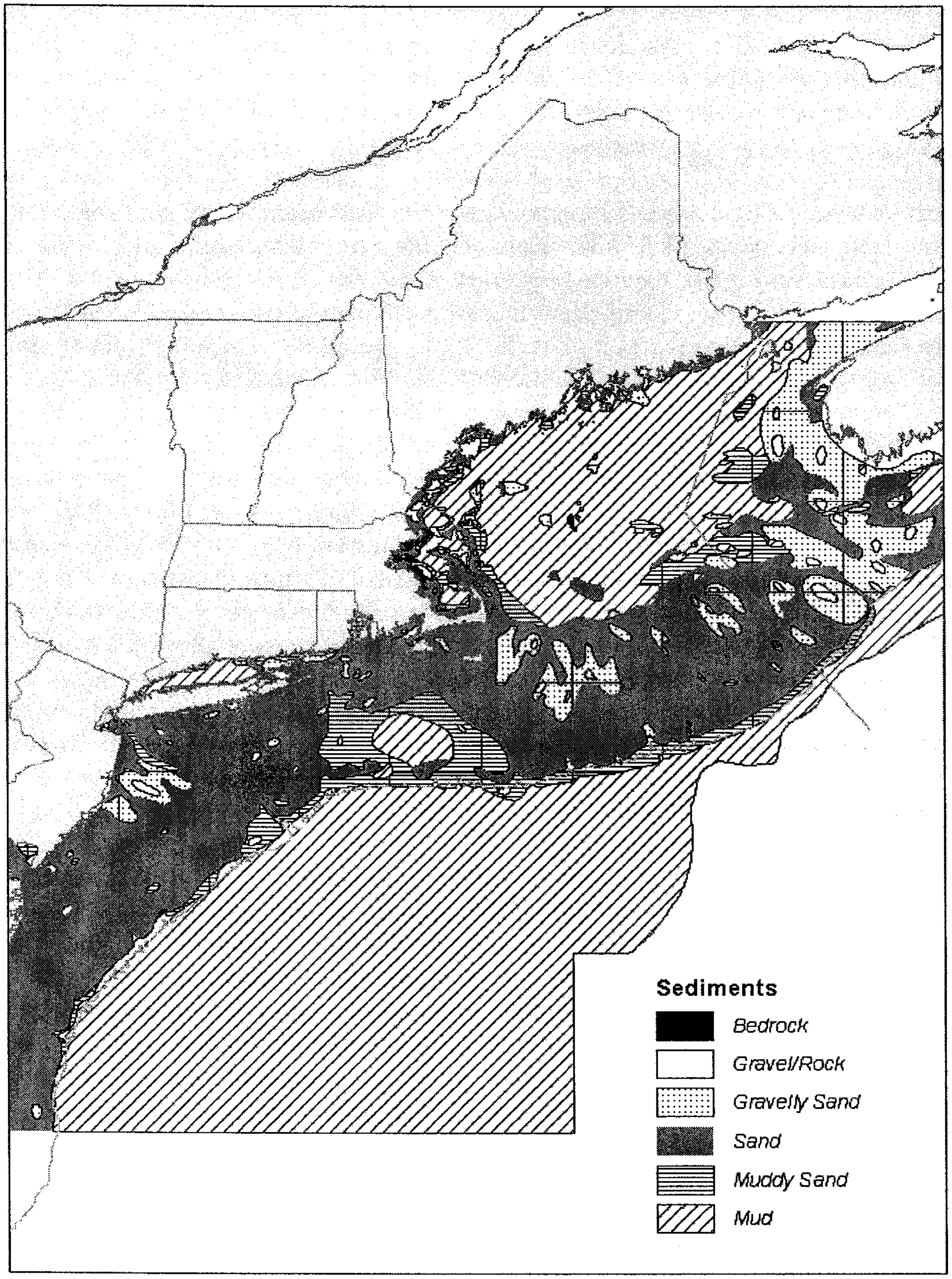


Figure 27- Map showing distribution of surficial sediments, Gulf of Maine, Georges Bank, and the Mid-Atlantic Bight (modified from original map by Poppe *et al.* 1989).

An intense seasonal cycle of winter cooling and turnover, springtime freshwater runoff, and summer warming influences oceanographic and biologic processes in the Gulf of Maine. The Gulf has a general counterclockwise nontidal surface current that flows around its coastal margin. It is primarily driven by fresh, cold Scotian Shelf water that enters over the Scotian Shelf and through the Northeast Channel, and freshwater river runoff, which is particularly important in the spring. Dense relatively warm and saline slope water entering through the bottom of the Northeast Channel from the continental slope also influences gyre formation. Counterclockwise gyres generally form in Jordan, Wilkinson, and Georges Basins and the Northeast Channel as well. These surface gyres are more pronounced in spring and summer; with winter, they weaken and become more influenced by the wind.

Stratification of surface waters during spring and summer seals off a mid-depth layer of water that preserves winter salinity and temperatures. This cold layer of water is called "Maine intermediate water" (MIW) and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western GOM. Tidal mixing of shallow areas prevents thermal stratification and results in thermal fronts between the stratified areas and cooler mixed areas. Typically, mixed areas include Georges Bank, the southwest Scotian Shelf, eastern Maine coastal waters, and the narrow coastal band surrounding the remainder of the Gulf. The Northeast Channel provides an exit for cold MIW and outgoing surface water while it allows warmer more saline slope water to move in along the bottom and spill into the deeper basins. The influx of water occurs in pulses, and appears to be seasonal, with lower flow in late winter and a maximum in early summer.

Gulf of Maine circulation and water properties can vary significantly from year to year. Notable episodic events include shelf-slope interactions such as the entrainment of shelf water by Gulf Stream rings (see *Gulf Stream and Associated Features*), and strong winds that can create currents as high as 1.1 meters/second over Georges Bank. Warm core Gulf Stream rings can also influence upwelling and nutrient exchange on the Scotian shelf, and affect the water masses entering the GOM. Annual and seasonal inflow variations also affect water circulation.

Internal waves are episodic and can greatly affect the biological properties of certain habitats. Internal waves can shift water layers vertically, so that habitats normally surrounded by cold MIW are temporarily bathed in warm, organic-rich surface water. On Cashes Ledge, it is thought that deeper nutrient rich water is driven into the photic zone, providing for increased productivity. Localized areas of upwelling interaction occur in numerous places throughout the Gulf.

5.2.1.2 Georges Bank

Georges Bank is a shallow (3-150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf which was formed by the Wisconsinian glacial episode and is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. It is anticipated that erosion and reworking of sediments will reduce the amount of sand available to the sand sheets, and cause an overall coarsening of the bottom sediments (Valentine et al. 1993).

Glacial retreat during the late Pleistocene deposited the bottom sediments currently observed on the eastern section of Georges Bank, and the sediments have been continuously reworked and redistributed by the action of rising sea level, and by tidal, storm and other currents. The strong, erosive currents affect the character of the biological community. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement, and steeper and smoother topography incised by submarine canyons on the southeastern margin (see *Continental Slope* for more on canyons). The nature of the seabed sediments varies widely, ranging from clay to gravel (Figure 27). The gravel-sand mixture is usually a transition zone between coarse gravel and finer sediments.

The central region of the bank is shallow; shoals and troughs characterize the bottom, with sand dunes superimposed upon them. The two most prominent elevations on the ridge-and-trough area are Cultivator and Georges Shoals. This ridge-and-trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km per hour, and as high as 7 km per hour. The dunes migrate at variable rates, and the ridges may move, also. In an area that lies between the central part and northeast peak, Almeida et al. (2000) identified high energy areas as between 35 – 65 m deep, where sand is transported on a daily basis by tidal currents; and a low energy area at depths > 65 m that is affected only by storm currents. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of the bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of traveling dune and swale morphology is also found in the Mid-Atlantic Bight.

The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm generated ripples, scattered shell and mussel beds. Tidal and storm currents may range from moderate to strong, depending upon location and storm activity (Valentine, pers. comm.).

Oceanographic frontal systems occur between water masses from the Gulf of Maine and Georges Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution. Currents on Georges Bank include a weak, persistent clockwise gyre around the bank, a strong semidiurnal tidal flow predominantly northwest and southeast, and very strong, intermittent storm-induced currents, which can all occur simultaneously. Tidal currents over the shallow top of Georges Bank can be very strong, and keep the waters over the bank well mixed vertically. This results in a tidal front that separates the cool waters of the well-mixed shallows of the central bank from the warmer, seasonally stratified shelf waters on the seaward and shoreward sides of the bank. The clockwise gyre is instrumental in distribution of the planktonic community, including larval fish. For example, Lough and Potter (1993) describe passive drift of Atlantic cod and haddock eggs and larvae in a southwest residual pattern around Georges Bank. Larval concentrations are found at varying depths along the southern edge between 60 – 100 m.

5.2.1.3 Mid Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 26). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

Shelf and slope waters of the Mid-Atlantic Bight have a slow southwestward flow that is occasionally interrupted by warm core rings or meanders from the Gulf Stream. On average, shelf water moves parallel to bathymetry isobars at speeds of 5-10 cm/second at the surface and 2 cm/second or less at the bottom. Storm events can cause much more energetic variations in flow. Tidal currents on the inner shelf have a higher flow rate of 20 cm/second that increases to 100 cm/second near inlets.

Slope water tends to be warmer than shelf water because of its proximity to the Gulf Stream, and also tends to be more saline. The abrupt gradient where these two water masses meet is called the shelf-slope front. This front is usually located at the edge of the shelf and touches bottom at about 75-100 m depth of water, and then slopes up to the east toward the surface. It reaches surface waters approximately 25-55 km further offshore. The position of the front is highly variable, and can be influenced by many physical factors. Vertical structure of temperature and salinity within the front can develop complex patterns because of the interleaving of shelf and slope waters – for example cold shelf waters can protrude offshore, or warmer slope water can intrude up onto the shelf.

The seasonal effects of warming and cooling increase in shallower, near shore waters. Stratification of the water column occurs over the shelf and the top layer of slope water during the spring-summer and is usually established by early June. Fall mixing results in homogenous shelf and upper slope waters by October in most years. A permanent thermocline exists in slope waters from 200-600 m. Temperatures decrease at the rate of about 0.02° C per meter and remain relatively constant except for occasional incursions of Gulf stream eddies or meanders. Below 600 m, temperature declines, and usually averages about 2.2° C at 4000 m. A warm, mixed layer approximately 40 m thick resides above the permanent thermocline.

The "cold pool" is an annual phenomenon particularly important to the Mid-Atlantic Bight. It stretches from the Gulf of Maine along the outer edge of Georges Bank and then southwest to Cape Hatteras. It becomes identifiable with the onset of thermal stratification in the spring and lasts into early fall until normal seasonal mixing occurs. It usually exists along the bottom between the 40 m and 100 m isobaths and extends up into the water column for about 35 m, to the bottom of the seasonal thermocline. The cold pool usually represents about 30% of the volume of shelf water. Minimum temperatures for the cold pool occur in early spring and summer, and range from 1.1° C to 4.7° C.

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 – 200 m water depth) at the shelf break. In both the Mid-Atlantic and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (see section on *Continental Slope*). The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales (Figure 28 & Figure 29).

Most of these structures are relic except for some sand ridges and smaller sand-formed features. Shelf valleys and slope canyons were formed by rivers of melted glaciers that deposited sediments on the outer shelf edge as they entered the ocean. Most valleys cut about 10 m into the shelf, with the exception of the Hudson Shelf Valley, which is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island. Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of gravel and gravelly sand (Figure 27). On the slope, muddy sand and mud predominate. Sediments are fairly uniformly distributed over the shelf in this region. A sheet of sand and gravel varying in thickness from 0 to 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf, but is common in the Hudson Shelf Valley. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the "mud line," and sediments are 70-100% fines on the slope.

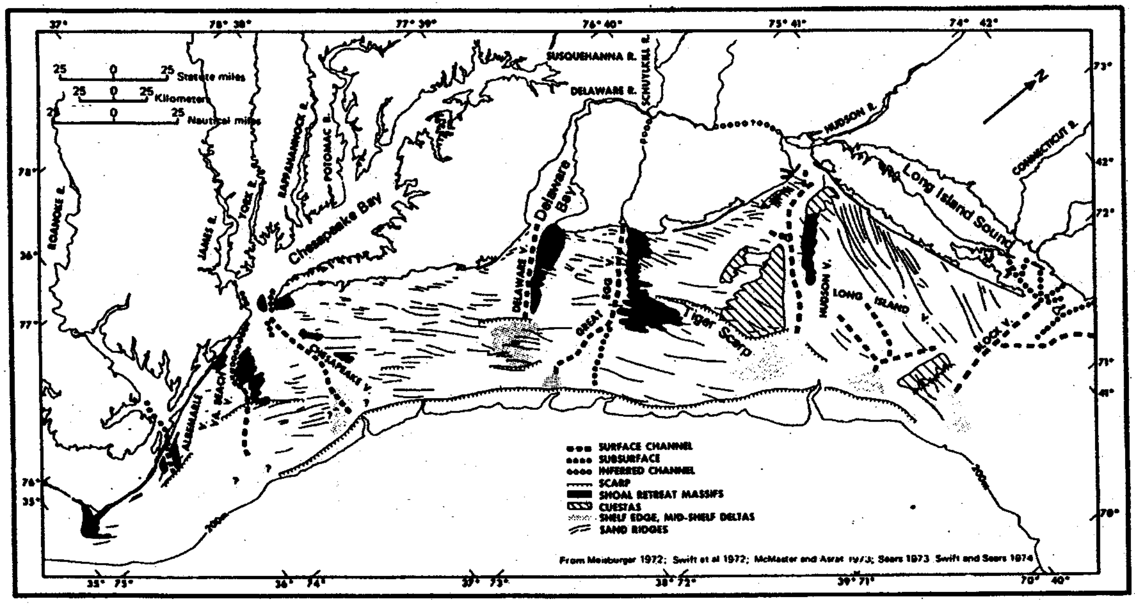


Figure 28- Mid-Atlantic Bight submarine morphology. Source: Stumpf and Biggs (1988).

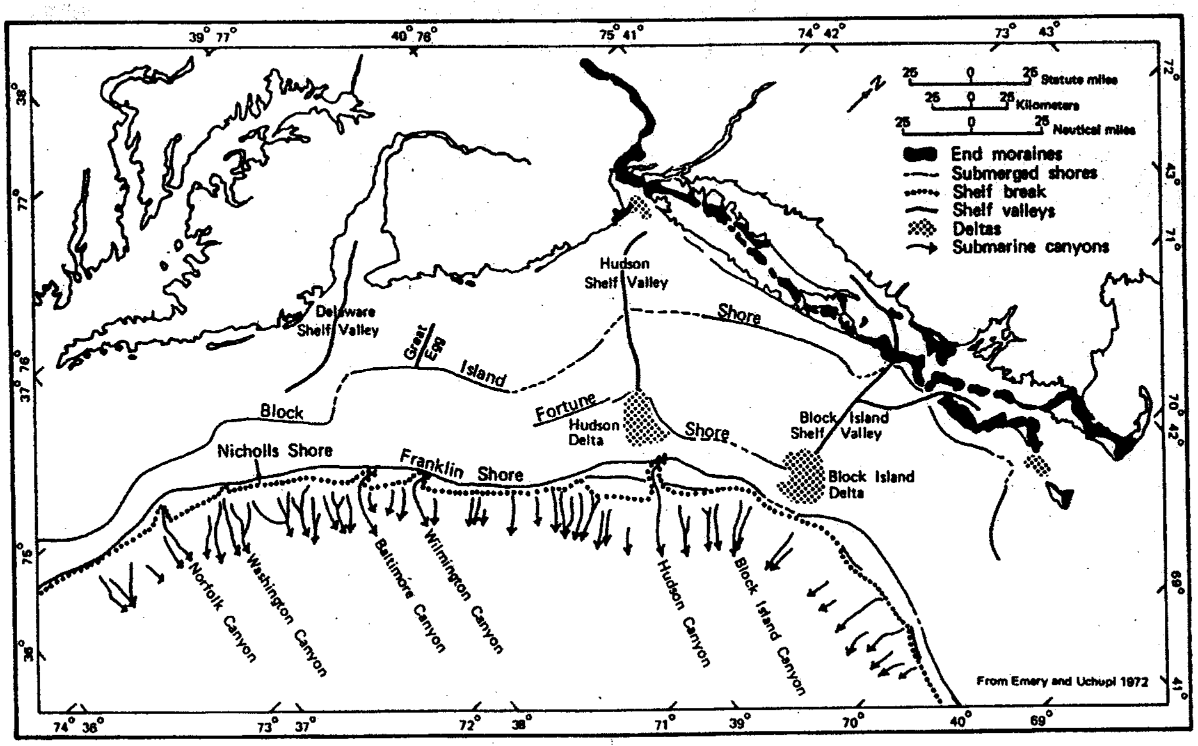


Figure 29- Major features of the Mid-Atlantic and Southern New England continental shelf. Source: Stumpf and Biggs (1988).

In addition to sand ridges that were formed by the glaciers, some sand ridges have been formed since the end of the last ice age. Their formation is not well understood; however, they appear to develop from the sediments that erode from the shore face. They maintain their shape, so it is assumed that they are in equilibrium with modern current and storm regimes. They are usually grouped, with heights of about 10 m, lengths of 10-50 km and spacing of 2 km. Ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. The seaward face usually has the steepest slope. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Swales occur between sand ridges. Since ridges are higher than the adjacent swales, they are exposed to more energy from water currents, and experience more sediment mobility than swales. Ridges tend to contain less fine sand, silt and clay while relatively sheltered swales contain more of the finer particles. Swales have greater benthic macrofaunal density, species richness and biomass, due in part to the increased abundance of detrital food and the physically less rigorous conditions.

Sand waves are usually found in patches of 5-10 with heights of about 2 m, lengths of 50-100 m and 1-2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3-5 m with heights of 0.5-1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50-100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf, and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1-150 cm and heights of a few centimeters.

The northern portion of the mid-Atlantic bight is sometimes referred to as southern New England. Some of the features of this area were described earlier (see *Georges Bank*); however, one other formation of this region that deserves note is the "mud patch" which is located just southwest of Nantucket Shoals and southeast of Long Island. Tidal currents in this area slow significantly, which allows silts and clays to settle out. The mud is mixed with sand, and is occasionally re-suspended by large storms. This habitat is an anomaly of the outer continental shelf.

Artificial reefs are another significant mid-Atlantic habitat, formed much more recently on the geologic time-scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of these materials have been deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. It is expected that the increase in these materials has had an impact on living marine resources and fisheries, but these effects are not well known. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure.

5.2.1.4 Continental Slope

The continental slope extends from the continental shelf break, at depths between 60 m and 200 m, eastward to a depth of 2000 m. The width of the slope varies from 10-50 km, with an average gradient of 3-6°; however, local gradients can be nearly vertical. The base of the slope is defined by a marked decrease in seafloor gradient where the continental rise begins.

The morphology of the present continental slope appears largely to be a result of sedimentary processes that occurred during the Pleistocene, including:

1) slope upbuilding and progradation by deltaic sedimentation principally during sea-level low-stands;
2) canyon-cutting by sediment mass movements during and following sea-level low-stands;
3) sediment slumping.

The slope is cut by at least 70 large canyons between Georges Bank and Cape Hatteras (Figure 30) and numerous smaller canyons and gullies, many of which may feed into the larger canyon systems. The New England Seamount Chain including Bear, Mytilus, Balanus, etc. occurs on the slope southwest of Georges Bank. A smaller chain (Caryn, Knauss, etc.) occurs in the vicinity in deeper water.

A "mud line" occurs on the slope at a depth of 250 m – 300 m, below which fine silt and clay-size particles predominate (Figure 27). Localized coarse sediments and rock outcrops are found in and near canyon walls, and occasional boulders occur on the slope as a result of glacial rafting. Sand pockets may also be formed as a result of downslope movements.

Gravity induced downslope movement is the dominant sedimentary process on the slope, and includes slumps, slides, debris flows, and turbidity currents, in order from thick cohesive movement to relatively non-viscous flow. Slumps are localized blocks of sediment that may involve short downslope movement. However, turbidity currents can transport sediments thousands of kilometers.

Submarine canyons are not spaced evenly along the slope, but tend to decrease in areas of increasing slope gradient (Figure 30). Canyons are typically "v"-shaped in cross section and often have steep walls and outcroppings of bedrock and clay. The canyons are continuous from the canyon heads to the base of the continental slope. Some canyons end at the base of the slope, but others continue as channels onto the continental rise. Larger and more deeply incised canyons are generally significantly older than smaller ones, and there is also evidence that some older canyons have experienced several episodes of filling and re-excavation. Many, if not all, submarine canyons may first form by mass-wasting processes on the continental slope, although there is evidence that some canyons formed as a result of fluvial drainage (i.e., Hudson Canyon).

Canyons can alter the physical processes in the surrounding slope waters. Fluctuations in the velocities of the surface and internal tides can be large near the heads of the canyons, leading to enhanced mixing and sediment transport in the area. Shepard et al. (1979) concluded that the strong turbidity currents initiated in study canyons were responsible for enough sediment erosion and transport to maintain and modify those canyons. Since surface and internal tides are ubiquitous over the continental shelf and slope, it can be anticipated that these fluctuations are important for sedimentation processes in other canyons as well. In Lydonia Canyon, Butman et al. (1982) found that the dominant source of low-frequency current variability was related to passage of warm core Gulf Stream rings rather than the atmospheric events that predominate on the shelf.

The water masses of the Atlantic continental slope and rise are essentially the same as those of the North American Basin (defined in Wright and Worthington 1970). Worthington (1976) divided the water column of the slope into three vertical layers: deep water (colder than 4°C), the thermocline (4°-17°C), and warm water (warmer than 17°C). In the North American Basin the deep water accounts for two-thirds of all the water, the thermocline for about one quarter, and the warm water the remainder. In the slope water north of Cape Hatteras, the only warm water occurs in the Gulf Stream and seasonally influenced summer waters.

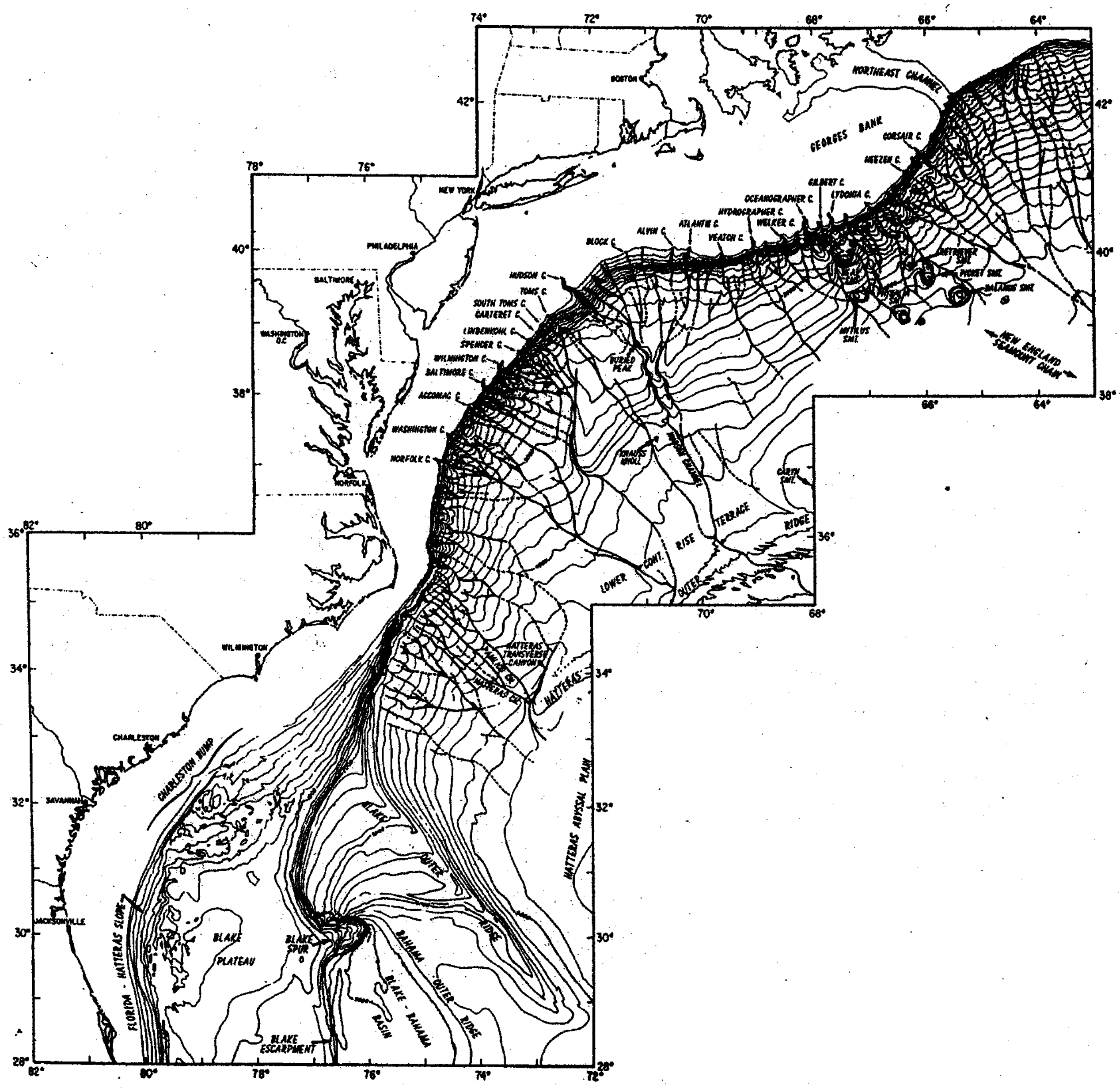


Figure 30- Bathymetry of the U.S. Atlantic continental margin.
Contour interval is 200 m below 1000 m water depth and 100 m above 1000 m. Axes of principal canyons and channels are shown by solid lines (dashed where uncertain or approximate). Source: Tucholke (1987)

The principal cold-water mass in the region is the North Atlantic Deep Water. North Atlantic Deep Water is comprised of a mixture of five sources: Antarctic Bottom Water, Labrador Sea Water, Mediterranean Water, Denmark Strait Overflow Water, and Iceland-Scotland Overflow Water. The thermocline represents a fairly straightforward water mass compared with either the deep water or the surface water. Nearly 90% of all thermocline water comes from the water mass called the Western North Atlantic Water. This water mass is slightly less saline northeast of Cape Hatteras due to the influx of southward flowing Labrador Coastal Water.

Seasonal variability in slope waters penetrates only the upper 200 m of the water column. In the winter months, cold temperatures and storm activity create a well-mixed layer down to about 100-150 m, but summer warming creates a seasonal thermocline overlain by a surface layer of low-density water. The seasonal thermocline, in combination with reduced storm activity in the summer, inhibits vertical mixing and reduces the upward transfer of nutrients into the photic zone.

Two currents found on the slope, the Gulf Stream and Western Boundary Undercurrent, together represent one of the strongest low frequency horizontal flow systems in the world. Both currents have an important influence on slope waters. Warm and cold core rings that spin off the Gulf Stream are a persistent and ubiquitous feature of the Northwest Atlantic Ocean (see section on *Gulf Stream*). The Western Boundary Undercurrent flows to the southwest along the lower slope and continental rise in a stream about 50 km wide. The boundary current is associated with the spread of North Atlantic Deep Water, and it forms part of the generally westward flow found in slope water. North of Cape Hatteras it crosses under the Gulf Stream in a manner not yet completely understood.

5.2.1.5 Gulf Stream and Associated Features

Shelf and slope waters of the Northeast are intermittently but intensely affected by the Gulf Stream. The Gulf Stream begins in the Gulf of Mexico and flows northeastward at an approximate rate of 1 m/second (2 knots), transporting warm waters north along the eastern coast of the United States, and then east towards the British Isles. Conditions and flow of the Gulf Stream are highly variable on time scales ranging from days to seasons. The principal sources of variability in slope waters off the northeastern shelf are intrusions from the Gulf Stream.

The location of the Gulf Stream's shoreward, western boundary is variable because of meanders and eddies. Gulf Stream eddies are formed when extended meanders enclose a parcel of seawater and pinch off. These eddies can be cyclonic, meaning they rotate counterclockwise and have a cold-core formed by enclosed slope water (cold core ring), or anticyclonic, meaning they rotate clockwise and have a warm core of Sargasso Sea water (warm core ring). The rings are shaped like a funnel, wider at the top and narrower at the bottom, and can have depths of over 2000 m. They range in size from approximately 150-230 km in diameter. There are 35% more rings and meanders in the vicinity of Georges Bank than in the Mid-Atlantic region. A net transfer of water on and off the shelf may result from the interaction of rings and shelf waters. These warm or cold core rings maintain their identity for several months until they are reabsorbed by the Gulf Stream. The rings and the Gulf Stream itself have a great influence over oceanographic conditions all along the continental shelf.

5.2.1.6 Coastal Features

Coastal and estuarine features such as salt marshes, mud flats, rocky intertidal zones, sand beaches, and submerged aquatic vegetation are critical to inshore and offshore habitats and fishery resources of the Northeast. For example, coastal areas and estuaries are important for nutrient recycling and primary production, and certain features serve as nursery areas for juvenile stages of economically important species. Salt marshes are found extensively throughout the region. Tidal and subtidal mud and sand flats are general salt marsh features and are also occur in other estuarine areas. Salt marshes provide nursery and spawning habitat for many finfish and shellfish species. Salt marsh vegetation can also be a large source of organic material that is important to the biological and chemical processes of the estuarine and marine environment.

Rocky intertidal zones are periodically submerged, high-energy environments found in the northern portion of the Northeast system. Sessile invertebrates and some fish inhabit rocky intertidal zones. A variety of algae, kelp, and rockweed are also important habitat features of rocky shores. Fishery resources may depend upon particular habitat features of the rocky intertidal that provide important levels of refuge and food.

Sandy beaches are most extensive along the Northeast coast. Different zones of the beach present suitable habitat conditions for a variety of marine and terrestrial organisms. For example, the intertidal zone presents suitable habitat conditions for many invertebrates, and transient fish find suitable conditions for foraging during high tide. Several invertebrate and fish species are adapted for living in the high-energy subtidal zone adjacent to sandy beaches.

5.2.1.7 Recent Oceanographic Conditions

The broad-scale hydrography of the Gulf of Maine – Georges Bank region is strongly influenced by variation in the major water mass fluxes into the Gulf of Maine. The two key sources of inflows to the Gulf of Maine are Scotian Shelf water, which is relatively cool and fresh, and slope water, which is relatively warm and more saline. The volume ratio of Scotian Shelf water to slope water was roughly 1:2 during the 1980s, while during the 1990s, the volume ratio has been roughly 2:1 (Pers. Comm. Dr. David Mountain, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543). As a result of these broad-scale changes in inputs, water salinity has been lower in the Gulf of Maine during the 1990s.

Changes in the relative salinity of the Gulf of Maine have been indexed by salinity anomalies on the northwest flank of Georges Bank during 1975-2001. The observed salinity anomaly index shows cyclic variation on a 3-5 year time scale. During the 1990s, the salinity anomaly index has been low. In particular, salinity was very low during the 1996-1999 period. Since 1999, the salinity index has returned to normal levels. Based on some recent research, it appears that when salinity is low during autumn, chlorophyll levels in the subsequent spring tend to be higher than average, indicating higher primary production in the Gulf of Maine. Whether this higher primary production funnels upward through the food web to improve growth of commercially-exploited fishes is not known, however.

During 1998, there was an unusual influx of Labrador slope water (LSW) into the Gulf of Maine (Pers. Comm. Dr. David Mountain, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543). The event began in January and was detectable through the autumn of

1998. Labrador slope water is cooler and fresher than the "normal" water mass of slope water that flows into the Gulf. Thus, the influx of LSW reduced water temperatures, on average, in 1998. This event was also notable because it was the first time since the 1960s that a LSW mass was observed in the Gulf of Maine. The unusual influx of LSW likely corresponds to a delayed response of local ocean conditions to the dramatic change in the North Atlantic Oscillation Index, a broad-scale measure of winter atmospheric pressure, during 1995-1996.

Monitoring of the Middle Atlantic Bight (MAB) and Gulf of Maine (GOM) has been conducted by the Marine Resources Monitoring, Assessment, and Prediction Program's (MARMAP's) Ships of Opportunity Program (SOOP) since the early 1970s. Jossi and Benway (2003) recently published a summary of temporal and spatial patterns of surface and bottom temperature and surface salinity for SOOP transects crossing these regions during 1991-2001, including time plots of anomalous conditions for spatially coherent sections of these transects during the period 1978-2001, as well as annual transect averages and departures for both regions.

Lowest average annual surface temperature in the MAB during 1978-2001 and in the GOM during 1978-97 (after which coverage was insufficient) occurred in 1996, departing from baselines in both regions by an average of 1.1°C. Highest average annual surface temperature during the same respective periods occurred in 1995 for the MAB, and in 1991 for the GOM, departing from baselines by 1.3°C for the MAB, and by 0.4°C for the GOM. Three years of consistently low average surface temperatures in the MAB ended in 1999, followed by two more years of positive departures. Surface salinities in the MAB had their lowest annual averages in 1998, departing from baselines by 1.1 practical salinity units. Four years of consistently low surface salinities in the MAB ended in 2000.

According to the SOOP data, bottom temperatures in the MAB were lowest in 1994, averaging 1.4°C below the baseline, while bottom temperatures in the GOM were lowest in 1997, averaging 0.5°C below the baseline. From 1999 through 2001, the MAB bottom temperatures were consistently above the baseline, with the maximum departure for the entire period of record of 1.8°C in 1999. The annual transect average data and the time plots reveal that the magnitude of departures from long-term means was greater for all features and in all regions during the 1990s than during earlier years.

Interestingly, recruitment of several groundfish stocks in the Gulf of Maine was above recent average levels in 1998. In particular, the 1998 year classes of white hake, American plaice, witch flounder, and Gulf of Maine cod were larger than might be expected given recent low levels of recruitment. In addition, the 1998 and 1999 year classes of Georges Bank haddock were large in comparison to recent levels. Overall, it appears that the LSW event of 1998 may have had a positive effect on larval survival of several groundfish stocks, as measured by recruitment estimates taken from stock assessments. Whether or not a similar effect occurred in monkfish is not certain. NMFS trawl survey data through Fall 2002 show a relative increase in the abundance of small (<20 cm) monkfish in the northern area since 1999, less so in the southern area with the exception of 2002 where abundance increased noticeably.

5.3 Human Environment of the Fishery

This updates information provided in the Final Environmental Impact Statement for the Monkfish Fishery Management Plan (submitted 9/15/98) and economic sections of the annual Stock Assessment and Fishery Evaluation (SAFE) Report on the Monkfish fishery. In many instances, the original EIS contained inconsistent time periods for analysis. Wherever possible this DSEIS uses a consistent time period for all analyses. Where appropriate, notable changes that may have occurred since the September, 1998 EIS are highlighted.

Until recently, monkfish (goosefish or angler) was an incidental catch in groundfish and sea scallop fisheries but had little or no commercial value. Around the turn of this century, fishermen had little use for monkfish: "*Two or more men, armed with pitchforks, attack a pile of fish in the checker, heaving overboard the skates, dogfish, monkfish, and other species considered wothless, and tossing haddock, cod, and other marketable fish into separate checkers*" (Alexander et al. 1915:21). Even by mid-century, "*[n]o commercial use has been made of the goosefish in America up to the present time*" (Bigelow and Schroeder 1953: 541).

Government records of monkfish catches were not kept until the 1960's when reported landings averaged less than a million pounds and a few hundred thousand dollars a year (Monkfish FEIS 1998: 116). During the 1970's however, a ten-fold increase in the price of tails lead to a 17-fold increase in trips reporting landings and in landings themselves. Also, during this decade, gillnet and sea scallop fishermen joined trawlers in reporting landings. Further growth in the demand for tails by Europe and livers by Japan and other Asian countries (South Korea in particular) fueled growth of U.S. dockside markets into the 1990s.

5.3.1 Vessels and Fishery Sectors

The gears used in the directed monkfish fishery are otter trawls and sink gillnets. Historically, vessels using scallop dredges also directed effort on monkfish, but the use of a dredge on a monkfish DAS was prohibited under the original FMP. Nevertheless, if a scallop dredge vessel catches its incidental limit of 300 lbs. of tails per DAS (or 996 lbs. whole wt. equivalent), and that vessel catches less than 1,000 lbs. of scallops per DAS, the trip could be identified by the standard threshold for analyzing "directed" fishing effort (that is, 50 percent of the total weight of fish on board). The following sections show the distribution of effort and landings by permit category, area and gear type.

The configuration of otter trawl nets used in the monkfish fishery varies by area, bottom type and other fisheries in which each particular vessel participates. For example, the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. While in the southern area the bottom characteristics are more consistent over large areas, in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud.

5.3.1.1 Permits

In 2002, there were 718 monkfish limited access vessels of which 92 percent were Category C and D vessels, that is they also held a limited access Multispecies (531 permits) or Scallop permit (176 permits) (Table 35). These have been essentially unchanged since implementation of the FMP in 1999. The remaining vessels (Categories A and B) do not hold scallop or monkfish permits, but have permits in other limited access fisheries.

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	NUMBER OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
		BLACK SEA BASS	FLUKE	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/ MACK./ BUT.	TILEFISH
A	15	9	3	8	0	0	0	0	6	2	1
B	40	21	5	15	0	0	0	0	11	0	3
C	328	122	247	265	200	0	0	155	139	105	1
D	335	117	195	296	331	0	0	21	148	100	5
Total	718	269	450	584	531	0	0	176	304	207	10

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENT OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
		BLACK SEA BASS	FLUKE	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/ MACK./ BUT.	TILEFISH
A	15	60%	20%	53%	0%	0%	0%	0%	40%	13%	7%
B	40	53%	13%	38%	0%	0%	0%	0%	28%	0%	8%
C	328	37%	75%	81%	61%	0%	0%	47%	42%	32%	0%
D	335	35%	58%	88%	99%	0%	0%	6%	44%	30%	1%
Total	718	37%	63%	81%	74%	0%	0%	25%	42%	29%	1%

Table 35 Number and Percent of monkfish limited access vessels also issued a limited access permit in other fisheries in 2002, by permit category and fishery.

5.3.1.2 Fishing effort

The total number of trips where monkfish were landed hovered around 20,000 from 1982 to 1985 but averaged 17,500 trips from 1986 to 1993 (Figure 31). An apparent near-doubling in number of trips in 1994-onward was due to a combination of factors that included a change in data collection systems and implementation of major amendments for scallops and multispecies. The conversion from a voluntary to a mandatory data collection system in 1994 also included a change in reporting of so-called "under-tonnage" vessels (less than 5 gross registered tons). Prior to 1994 these vessels were not uniquely identified so their activity could not be tracked. From 1994 to 2002 the number of trips taken by vessels less than 5 GRT averaged just over 5,000 or about 15% of total trips. Assuming that this proportion of small vessel to total trips reflects pre-1993 conditions, the combined effect of growing monkfish export markets and changes in scallop and multispecies management could have resulted in an average increase of 14,000 trips landing monkfish in the Northeast region. With increasing price during the 1990's, and the lack of regulation, monkfish was an attractive alternative fishery for trawl, dredge and gillnet vessels facing restrictions in major northeast fisheries such as multispecies, scallops and summer flounder.

Starting in Year 2 of the FMP (May, 2000 –April, 2001) limited access monkfish vessels (Categories A, B, C, and D) were allocated 40 monkfish DAS. By definition, Category A and B vessels do not qualify for limited access multispecies or scallop permits, and Category C and D vessels must use either a multispecies or scallop DAS while on a monkfish DAS. However, in the NFMA, there is no monkfish trip limit when a vessel is on either a combined (monkfish/multispecies or monkfish/scallop) DAS or a multispecies-only DAS. Therefore, multispecies vessels in Categories C and D and fishing in the NMFA did not call-in monkfish DAS.

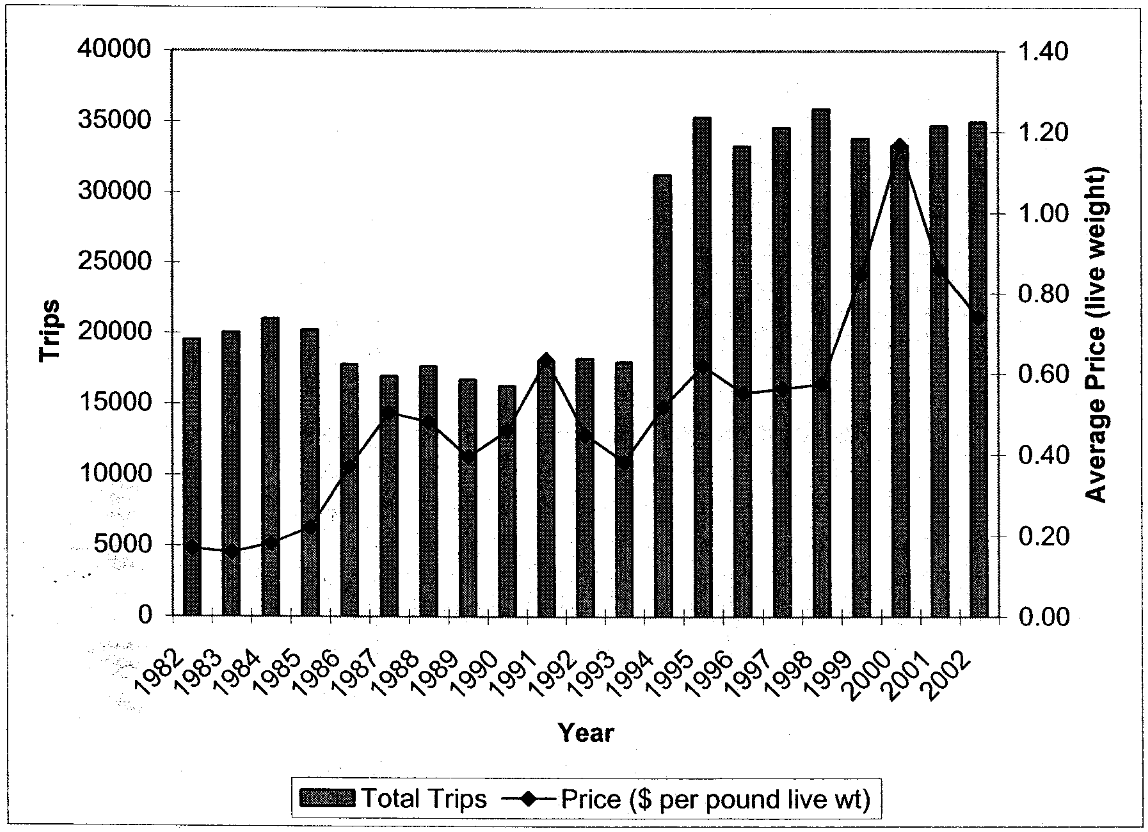


Figure 31 Total number of reported trips landing monkfish, and average price per pound, calendar years 1982-2002

Table 36 and Figure 32 show the monthly DAS usage for vessels calling-in for the three years since DAS were implemented under the FMP. While DAS usage in December and January of FY2002 were the highest of the three years for those months, overall DAS usage has declined each year, and was 18 percent lower in FY2002 than in FY2000, the first year of the DAS program.

Figure 33 shows the monthly monkfish DAS usage by permit category. All permit categories exhibit essentially the same seasonal pattern with peak effort on monkfish taking place during November-February. During this period, demand in both Asia (for livers and whole monkfish) and Europe (for tails) is highest, and the livers are at their peak size relative to body weight.

	Cumulative DAS		
	FY2000	FY2001	FY2002
May	705	772	398
June	1213	1329	930
July	1354	1455	1029
Aug	1434	1602	1070
Sept	1658	1696	1135
Oct	1946	2046	1371
Nov	3003	2620	1941
Dec	3749	3171	2715
Jan	4353	3713	3345
Feb	4690	4025	3642
Mar	4858	4250	3873
Apr	5292	4802	4359

Table 36 Cumulative monthly monkfish DAS usage by vessels fishing in the SFMA, FY2000-FY2002

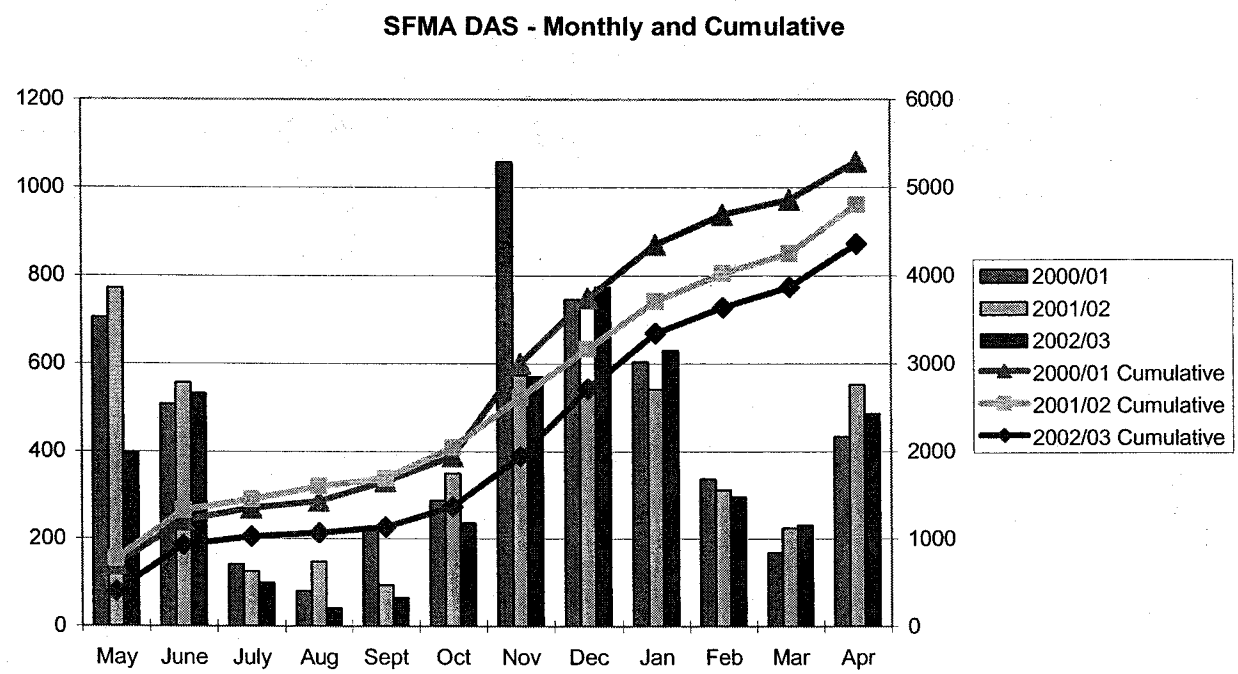


Figure 32 Monthly and cumulative monkfish DAS usage, SFMA, FY2000 – FY2002.

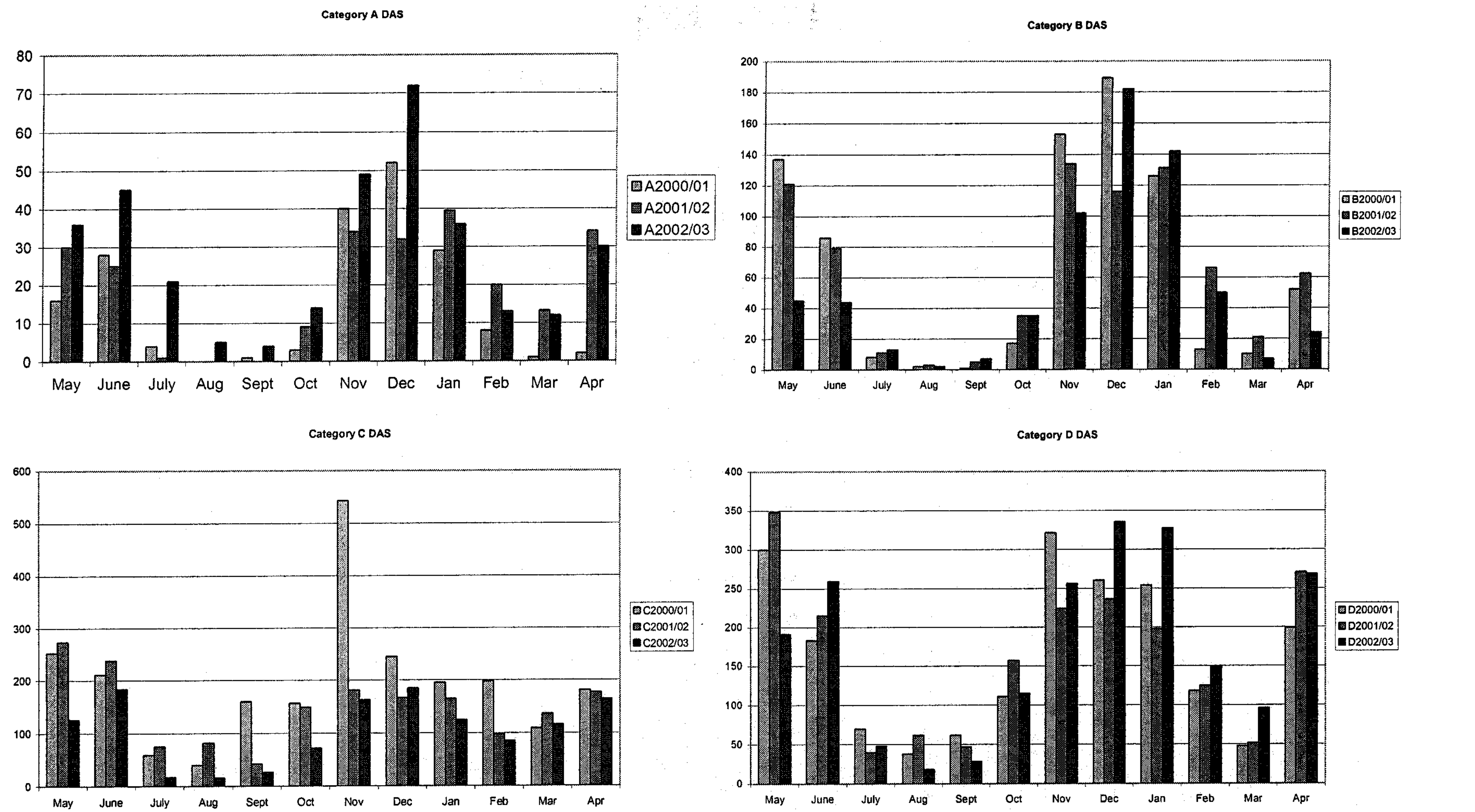


Figure 33 Monthly monkfish DAS usage by permit category, FY2000-FY2002

Table 37 shows the distribution of DAS allocated and used by all vessels and those that called in on a monkfish DAS in FY2000 and FY2001, respectively. The call-in vessels represent effort only in the SFMA since vessels in the NFMA on a multispecies DAS have no monkfish trip limit and do not call in a monkfish DAS, although some vessels fished in both areas.

Permit Category	All Vessels		Call-in Vessels	
	DAS Allocated	DAS Used	DAS Allocated	DAS Used
A	608	336	518	336
B	1,633	653	1,303	653
C	16,086	1,281	3,076	1,281
D	16,600	2,090	5,192	2,090
TOTAL	**34,927**	**4,360**	**10,089**	**4,360**

Source: NMFS Office of Law Enforcement, DAS call-in database

Table 37 Monkfish DAS allocated and used by permit category, FY2002 used by vessels calling in a monkfish DAS (SFMA only)

Table 38 shows the DAS usage by vessels that called in to use monkfish DAS broken down into monkfish-only, monkfish/multispecies and monkfish/scallop vessels in FY2002, and the usage rate in FY2001. According to public comment, many vessel operators in the SFMA, particularly in the scallop and multispecies trawl fisheries chose not to call-in their monkfish DAS because they opted to target scallops or groundfish. Unused monkfish DAS in Category C and D vessels most likely reflects the impact of restrictive trip limits combined with increased catch rates in scallops and groundfish fisheries on the decisions of vessel operators about where to direct their effort. Changes in either parameter (that is, increased monkfish trip limits or reduced catch rates in groundfish or scallops) could result in greater utilization of monkfish DAS, as directing effort on monkfish would become relatively more profitable. Furthermore, as multispecies DAS allocations are reduced below the 40 monkfish DAS allocation, some vessels may fish the difference as monkfish only DAS. Also, as noted in the preceding paragraph, Multispecies/Monkfish vessels that fished in both SFMA and NFMA only called in monkfish DAS when fishing in the SFMA, therefore, monkfish DAS used for those vessels do not reflect their fishing effort on monkish in the NFMA.

Permit Category	DAS Allocated	DAS Used					
		Monkfish	Monkfish/ Multispecies	Monkfish/ Scallop	Total	% Used FY2002	% Used FY2001
A	518	336	0	0	336	65%	65%
B	1,303	653	0	0	653	50%	63%
C	3,076	0	1,281	0	1,281	42%	49%
D	5,192	0	2,090	0	2,090	40%	41%
TOTAL	**10,089**	**989**	**3,371**	**0**	**4,360**	**43%**	**0%**

Source: NMFS Office of Law Enforcement, DAS call-in database

Table 38 Monkfish DAS usage rate FY2001 and FY2002, showing monkfish only, monkfish/multispecies and monkfish/scallop DAS used by vessels calling in a monkfish DAS (SFMA only)

5.3.2 Landings and Revenues

5.3.2.1 Long term overview and trend in distribution of revenues by gear

From 1982 to 1988 monkfish landings ranged from 16 to 21 million pounds (live weight) while gross revenue increased steadily from $2.8 to $10.1 million (Figure 34). Both landings and value more than tripled over the next nine years and landings reached an historic high of 62.1 million pounds in 1997. Although international demand for monkfish was strong during this time, the increased landings were also attributable to changes in both groundfish and scallop management that made monkfish a more attractive alternative fishery which also prompted development of the monkfish FMP (implemented in October, 1999). Following implementation, landings fell about 10 million pounds to 46 million pounds in 2000 but have since risen to approximately 50 million pounds in 2001 and 2002.

The relative importance of monkfish has changed compared to groundfish and scallops. From 1985 to 1990 monkfish revenue ranged from 3 to 5-percent of combined revenues from scallops, monkfish, and groundfish (Figure 35). As both groundfish and scallop revenues were declining from 1991 through 1998 monkfish revenues were increasing and contributed over 17% of combined fishing revenues in 1998. From 1999 onward, both groundfish and scallop revenues have increased, and while the proportion of monkfish revenues kept pace in 1999 and 2000, the proportion of total combined revenue from monkfish, scallops, and groundfish coming from monkfish has declined to under 11-percent.

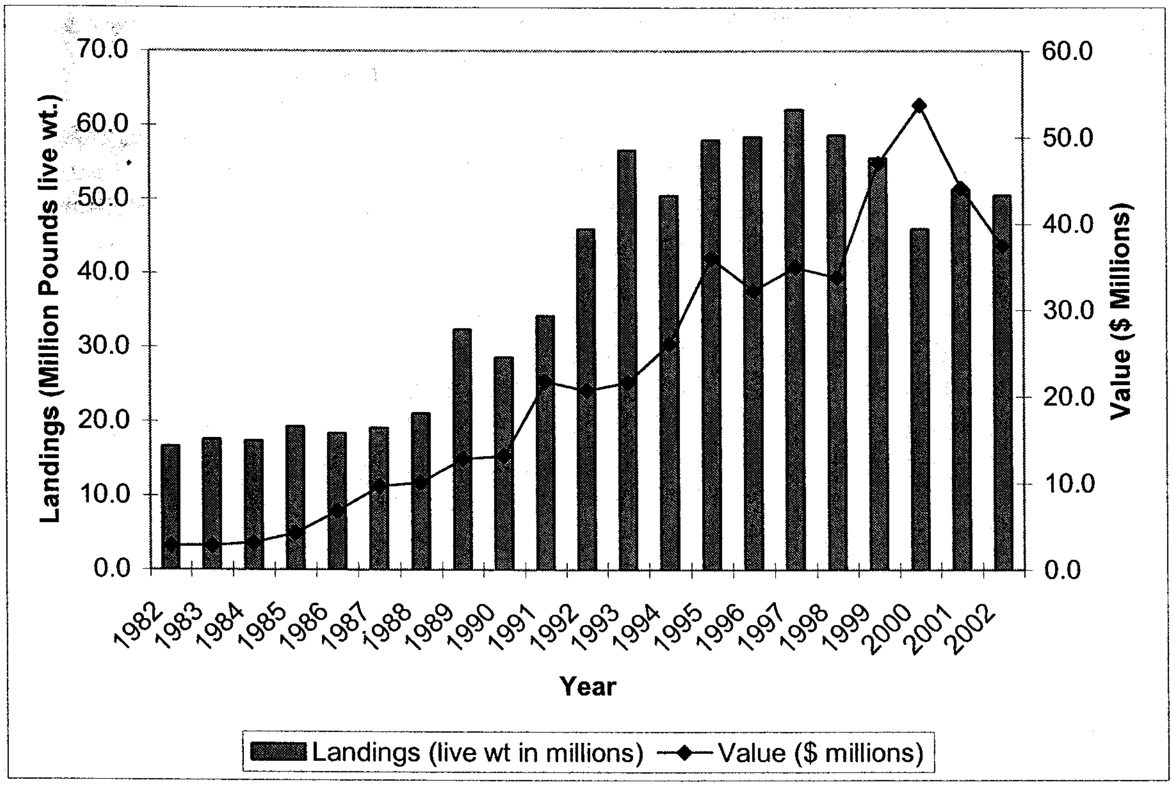


Figure 34 Monkfish landings and value, calendar years 1982-2002

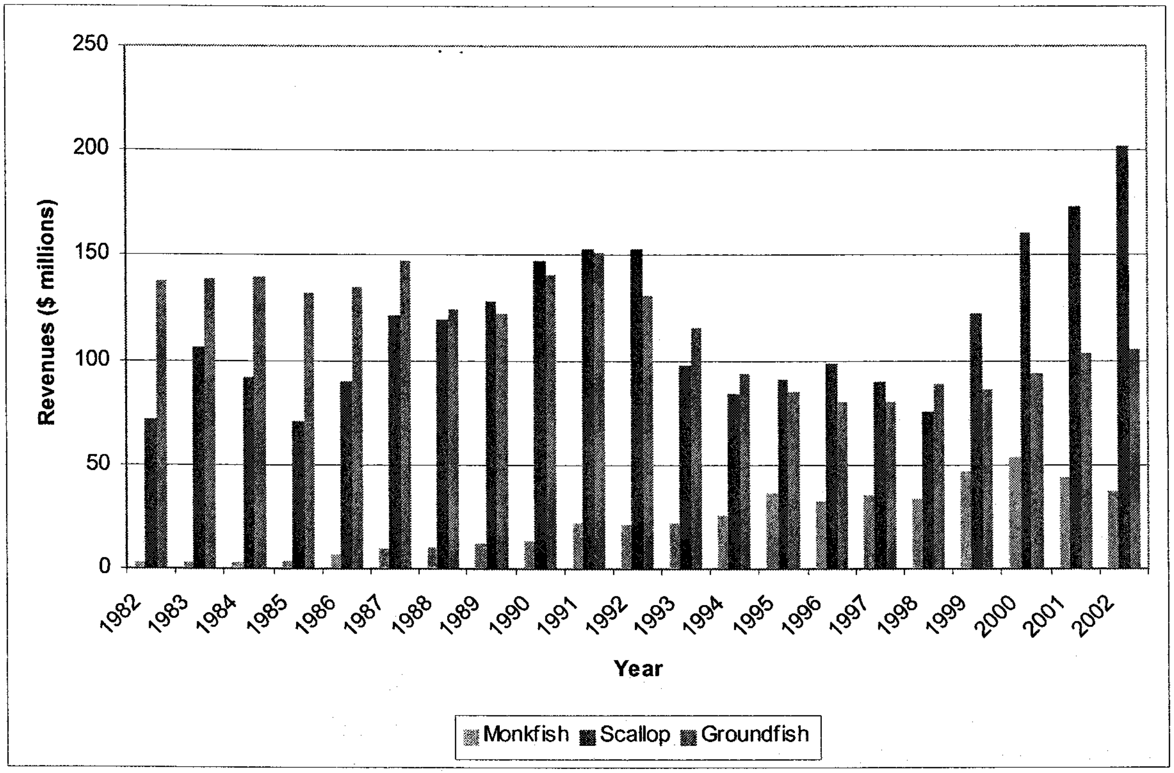


Figure 35 Comparison of revenues from monkfish, groundfish and scallops, 1982-2002

Prior to the mid-1970's, only groundfish trawlers reported monkfish landings, and their number of trips remained below 2,000 annually (Monkfish FMP at page 130). During the mid-1970's gillnet and scallopers began to report monkfish landings. From 1982 through 1993 the total number of trips where monkfish were landed ranged from 21 to 16 thousand of which the majority were taken by trawl gear (Figure 36). However, the number of trips reporting monkfish with either gillnet or scallop dredge gear was increasing over this time period while the number of trawl gear trips was declining. As noted earlier, the conversion to a mandatory data collection system in 1994 brought a larger number of vessels into the weighout system. Thus, the apparent large increase in number of trips occurring in 1994 was, in part, an artifact of this changeover (earlier estimated to represent about 15% of total trips taken from 1994 to 2002), but in no small measure, was also due to; 1) continued development of monkfish markets; 2) declining stock status of major Northeast region fisheries; and 3) significant management changes in groundfish and scallop fisheries.

In 1982 trawl gear accounted for about 70% of monkfish revenue (Figure 37). However, over the next 10 years the share of monkfish revenue going to scallop dredge vessels increased from 25% to 50% in 1990 before declining steadily over the next 12 years to less than 5% in 2002. Note that significant improvements in scallop resource conditions as well as more restrictive trip limits when using scallop dredge gear has reduced the incentive of scallop vessels to direct on monkfish. As scallop dredge revenue share was declining, the proportion of monkfish revenue going to gillnet gear was increasing from less than 3% in 1990 to more than 50% in 2002. Trawl vessel revenue share has declined but remained relatively stable ranging between 47 and 55% from 1993 through 2001 before falling to 41% in 2002.

The seasonal pattern of monkfish revenues varies by gear with gillnet gear exhibiting a bimodal fishing pattern while scallop dredge and trawl vessel revenue exhibits a distinct cyclical pattern. Scallop dredge vessel revenues peak in late fall - October and November - decline through March before rising gradually through the summer and into the fall (Figure 38). Trawl vessel revenues follow a similar pattern peaking in late fall and the winter but remain relatively high through April (Figure 39). Trawl vessel landings are lowest May through August before picking up again in September. Like both scallop dredge and trawl gear, monkfish revenues by gillnet vessels peak in late fall and early winter but revenues also peak during early spring/late summer when both scallop dredge and trawl revenues are lowest (Figure 40). Gillnet revenues are lowest in late winter/early spring and again in late summer/early fall.

In addition to differences in seasonal revenue patterns there are difference in product form landed by gear. In every year from 1982 to 2002, revenue from the sale of tails comprised over 70% of total sales by scallop dredge vessels (Figure 41). The proportion of revenue from liver sales increased to 25% of scallop dredge revenue in 1994 but has since declined to less than 5% of total monkfish in 2002 where revenue from tails was almost 92% of total revenue. Trawl vessels also earn the majority of monkfish revenue from tails but the proportion of monkfish sales from whole monkfish has been increasing (Figure 42). As a proportion of total monkfish revenue, the sale of whole monkfish has increased significantly for gillnet vessels and in 2002 was more than 80% of total monkfish sales (Figure 43).

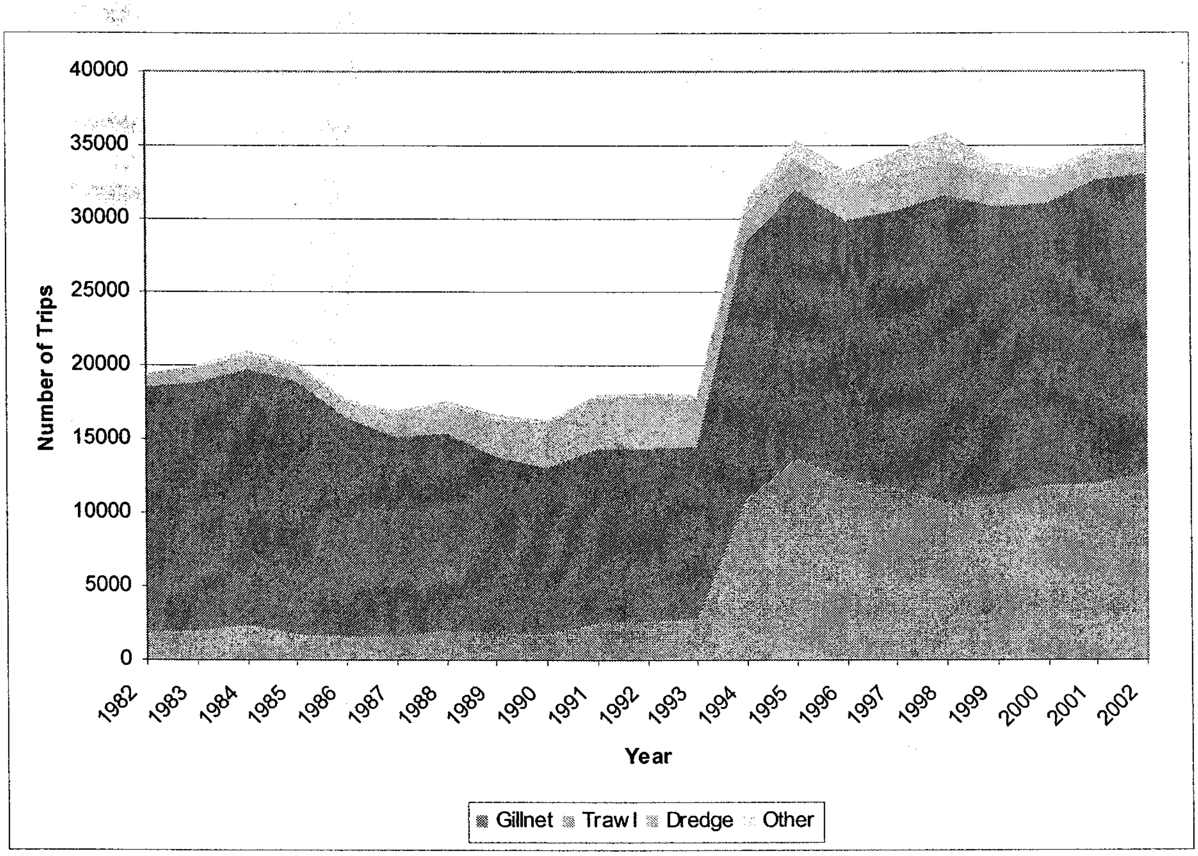


Figure 36 Monkfish landings by gear, 1982-2002

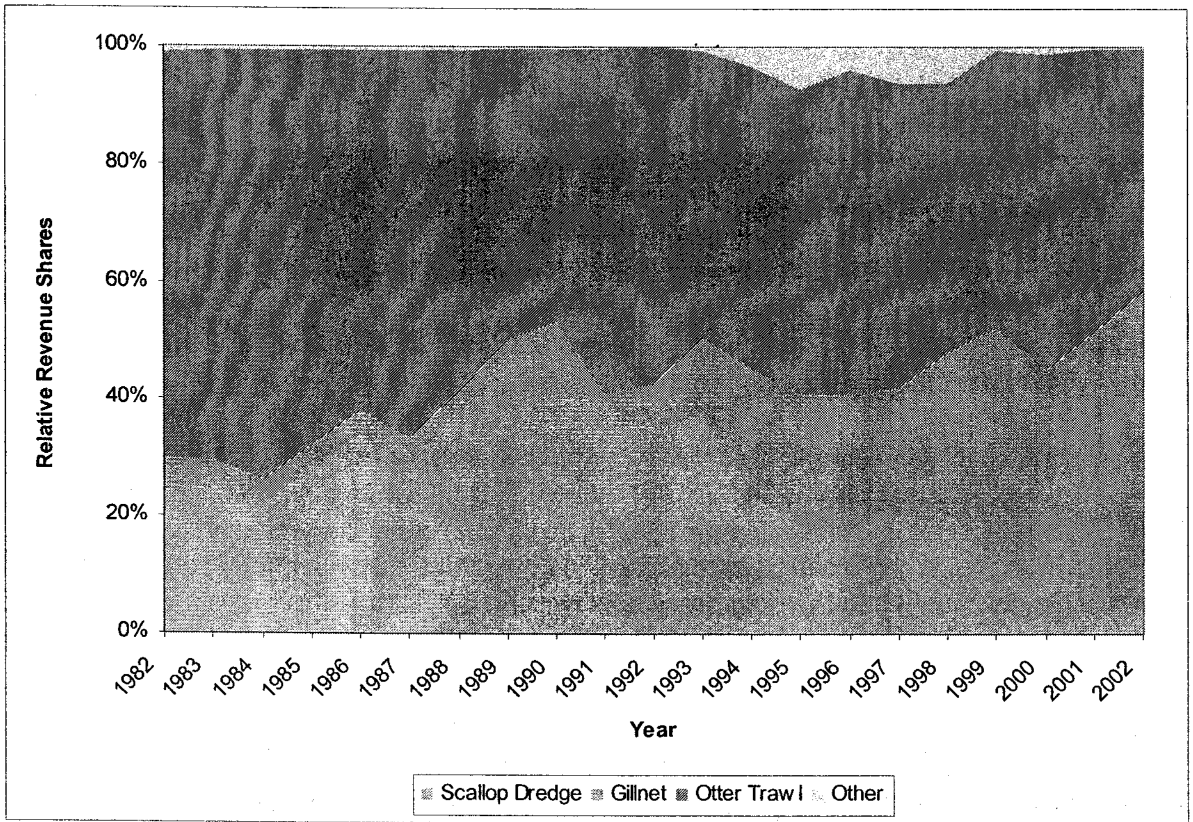


Figure 37 Relative distribution of monkfish landings by gear, 1982-2002.

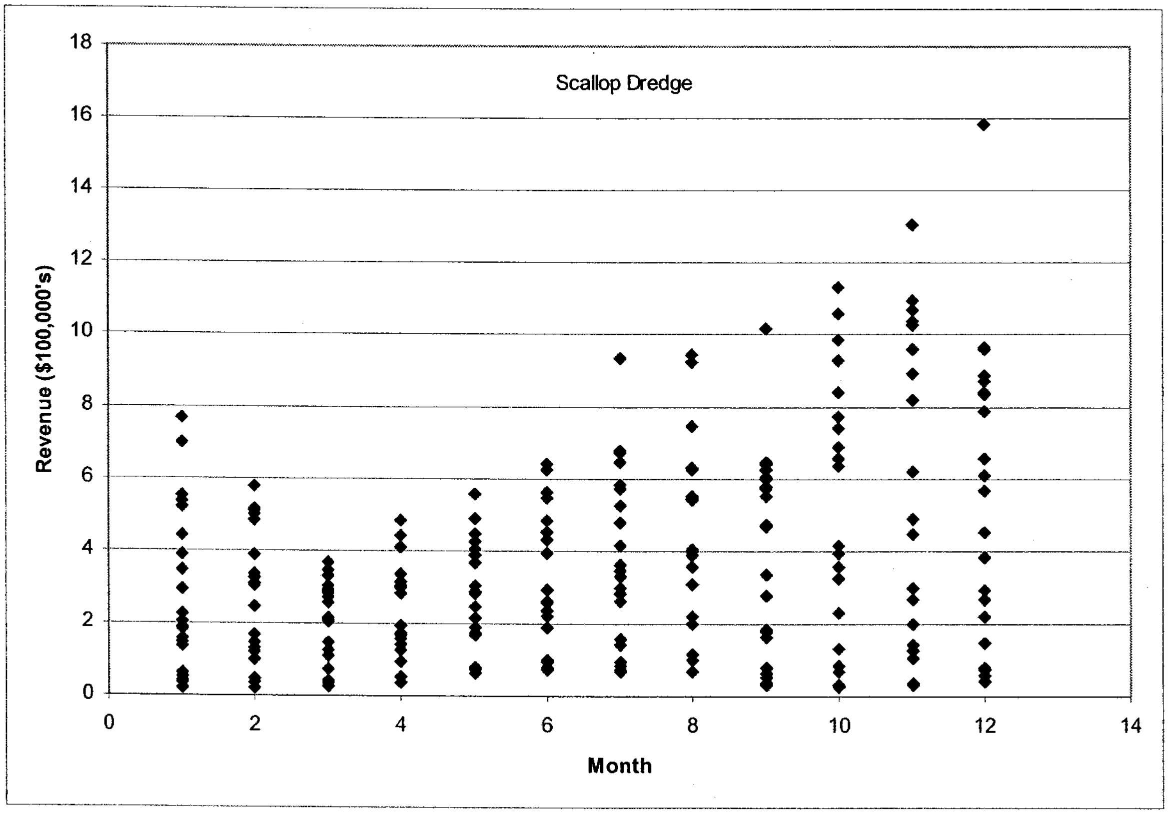


Figure 38 Monthly monkfish landings by scallop dredge, 1982-2002

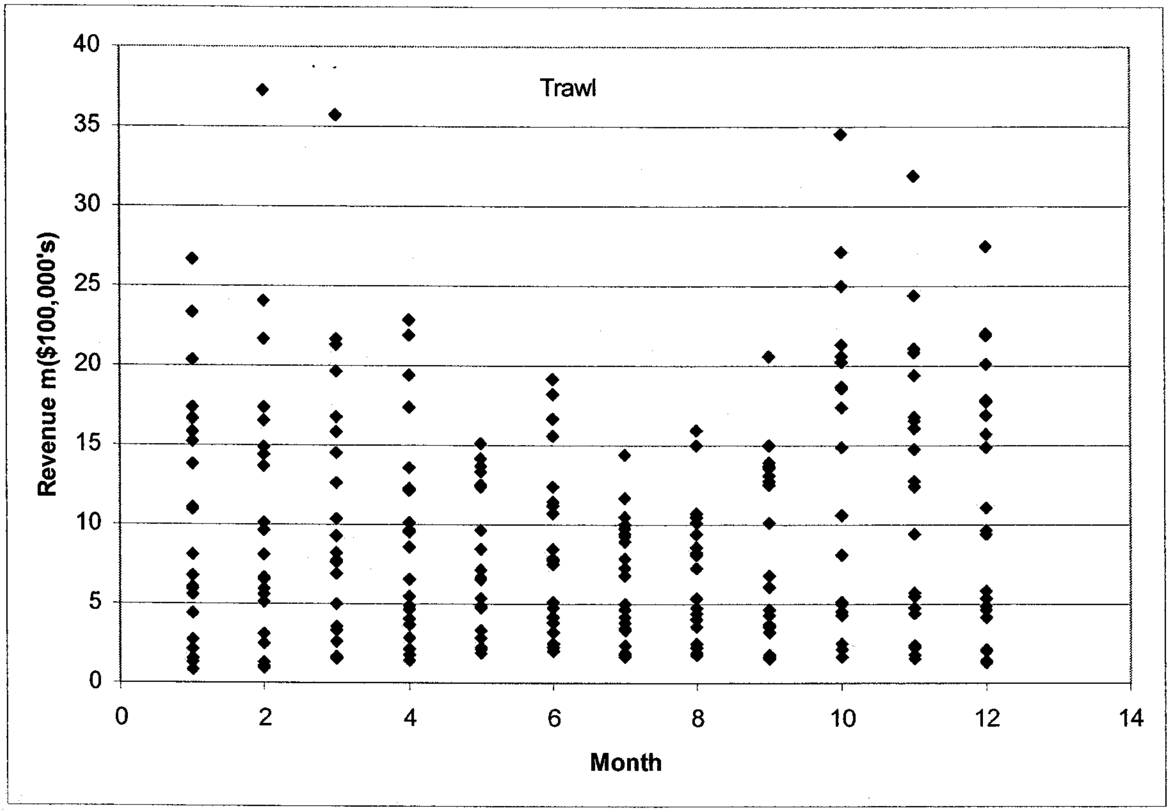


Figure 39 Monthly monkfish landings by otter trawl, 1982-2002

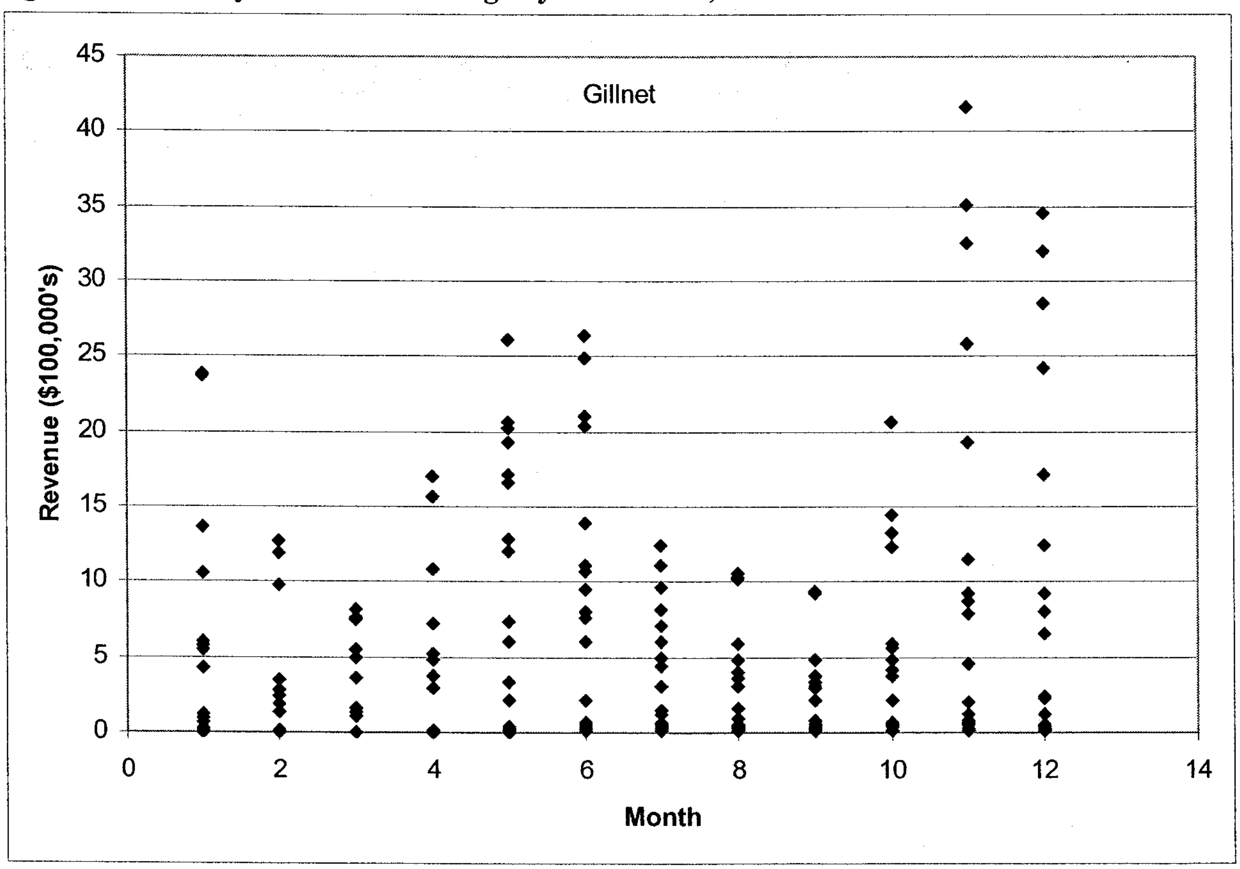


Figure 40 Monthly monkfish landings by gillnet, 1982-2002

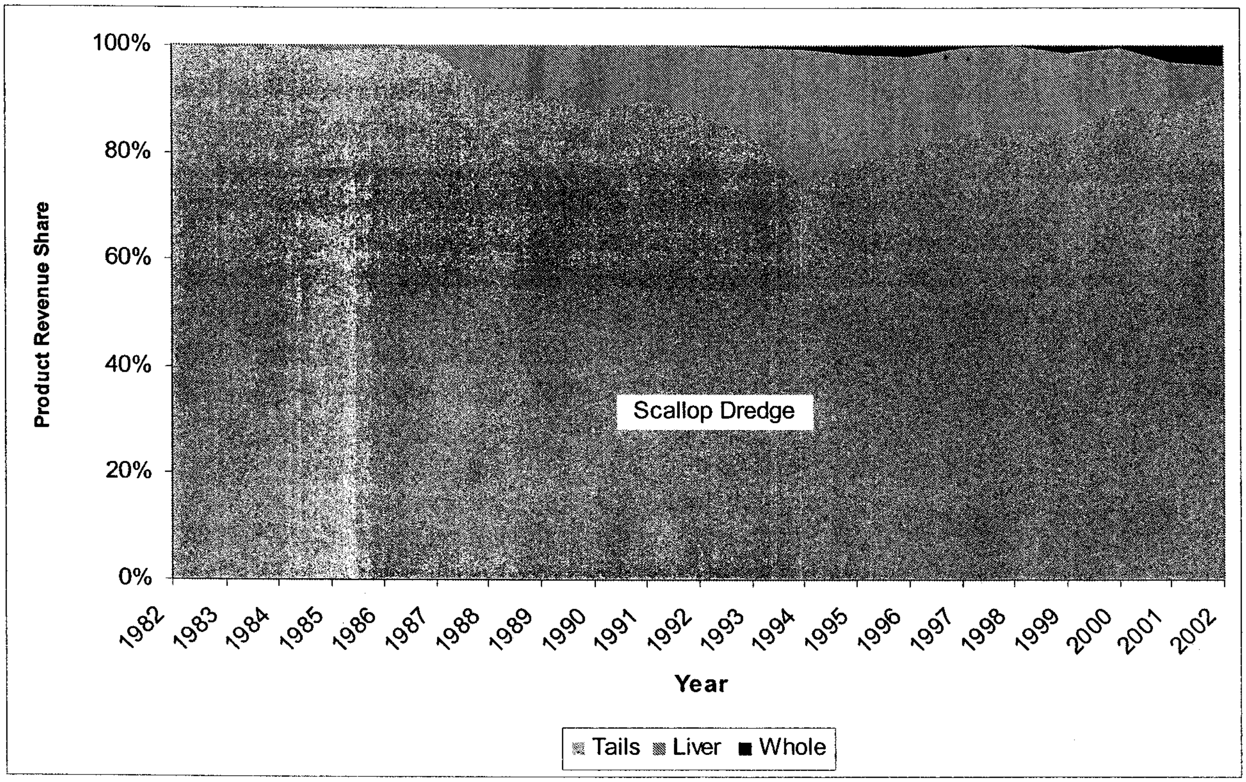


Figure 41 Scallop dredge monkfish revenue share by product form, 1982-2002

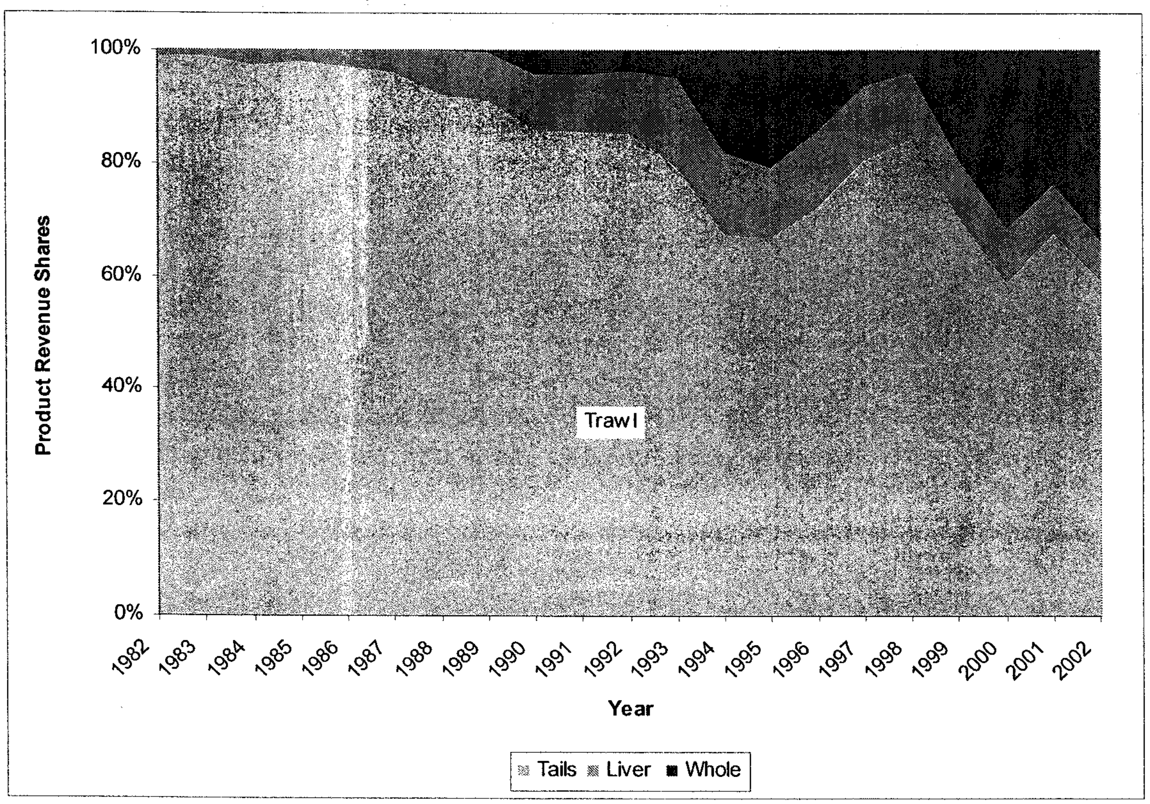


Figure 42 Otter trawl monkfish revenue share by product form, 1982-2002

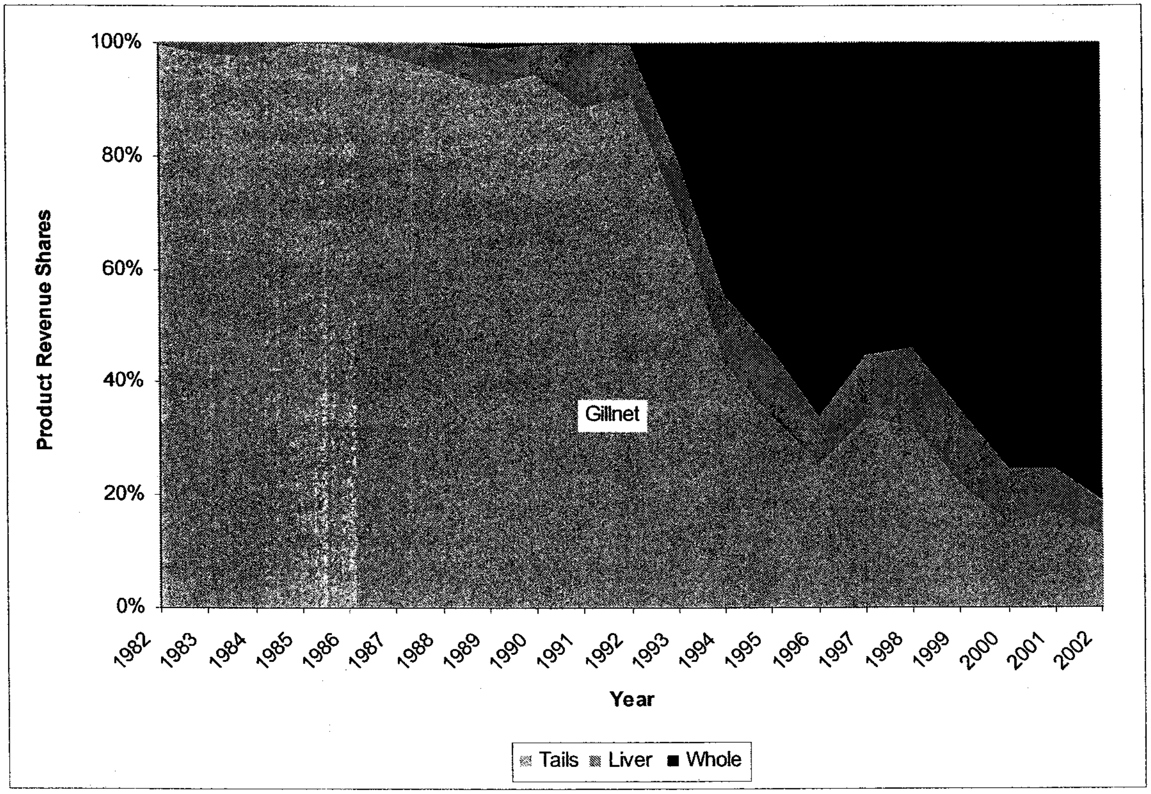


Figure 43 Gillnet monkfish revenue share by product form, 1982-2002

5.3.2.2 Post-FMP trend in landings and revenues

5.3.2.2.1 Overview

Since implementation of the FMP on November 8, 1999, all monkfish permit holders are required to report landings on their vessel trip reports (VTR). All permitted dealers must submit dealer reports. While dealer data are more complete, they do not show the area from which the landings are caught. Table 39 shows landings by month, management area and gear type for FY2002. (Note: the following discussion is based on fishing year landings, not calendar year landings as above). Since VTR data only captures about 70 percent of the landings in the dealer reports, Table 39 shows dealer data that have been prorated by the VTR data to each management area. For comparison, Table 40 shows monthly landings by gear from the dealer reports in FY2002 as both landed weights (B) and converted to live weights (A). Landed weight is the actual weight of the landings regardless of product form (whole, tails, etc.), while live weight shows a conversion to the weights of the fish that those landings represent. Figure 44 shows the ratio of live weight to landed weight by gear. A higher ratio, such as for gillnets, indicates that more fish are landed whole or headed and gutted, rather than in tail form.

In FY2002 the NFMA, landings declined 3 percent from the previous year to 31.4 million pounds (14,259 mt), while in the SFMA they declined 34 percent to 16 million pounds (7,276 mt) (Table 41 and Figure 45). The decline in SFMA landings was largely due to the lower trip limit in FY2002. The percentage of total landings by gear type has remained fairly constant over the past three years in the NFMA, but has changed significantly in the SFMA (Table 42, and Figure 46). Gillnets accounted for 49 percent of the total SFMA landings in FY1999, and for 40 percent in FY2000, but increased to 60 percent in FY2001 and 71 percent in FY2002. The increase in the proportion of SFMA landings attributed to gillnets in FY2001 is due to a combination of factors, such as the negative effect of the trip limits and DAS system on trawl vessels (without the ability to use a "running clock"). However, the primary cause is the impact starting in November, 2001of a federal court decision in the case of *Hall et al. v. Evans et al.* (C.A. No. 99-5491[D.R.I.]) eliminating the gear-based trip limit differential. (See Section 2.5.2.1)

1,000 Lbs.	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY 02-APR 03
NORTHERN	**1,151**	**2,237**	**2,284**	**2,622**	**3,058**	**2,833**	**2,295**	**2,492**	**2,770**	**2,792**	**4,919**	**1,982**	**31,436**
OTTER TRAWL	1,038	1,435	1,128	1,407	2,169	2,215	1,660	1,930	2,633	2,762	4,885	1,933	25,194
GILLNET	113	791	1,100	1,149	867	612	606	557	135	30	33	49	6,042
HOOK	0	0	0	0	0	0	0	0	0	0	0	0	1
OTHER GEARS	0	11	56	66	21	6	29	5	2	0	1	0	198
SOUTHERN	**2,354**	**2,263**	**649**	**374**	**277**	**769**	**1,925**	**2,341**	**1,673**	**1,093**	**882**	**1,441**	**16,040**
OTTER TRAWL	182	165	147	91	125	212	226	266	260	338	348	111	2,472
GILLNET	1,712	1,875	284	56	68	411	1,508	1,948	1,331	667	384	1,206	11,450
HOOK	0	0	0	0	0	0	1	0	0	0	0	0	2
OTHER GEARS	460	223	218	227	84	146	190	127	82	88	149	124	2,116
ALL AREAS	**3,505**	**4,500**	**2,933**	**2,996**	**3,334**	**3,603**	**4,220**	**4,833**	**4,443**	**3,885**	**5,801**	**3,423**	**47,476**
OTTER TRAWL	1,220	1,600	1,275	1,498	2,294	2,428	1,886	2,196	2,893	3,100	5,233	2,044	27,666
GILLNET	1,825	2,665	1,384	1,205	935	1,024	2,114	2,505	1,466	697	417	1,255	17,493
HOOK	0	0	0	0	0	0	1	0	0	0	0	0	3
OTHER GEARS	460	234	274	293	105	151	219	132	84	88	150	124	2,314

Source: NMFS Statistics Office, dealer weighout database

1. *The three digit statistical areas defined below are for statistical and management purposes and may not be consistent with stock area delineation used for biological assessment (see the attached statistical chart)*
   Monkfish Stock Areas: Northern: 464-465, 467, 511-515, 521-522, 561-562
   Southern: 525-526, 533-534, 537-539, 541-543, 611-639
2. *State landings for CT are estimated for 2002 & 2003*
3. *Landings in live weight*
4. *Gear data are based on vessel trip reports*

Table 39 Fishing year (May 2002 – April 2003) monkfish landings by Area, Gear and Month.

A) Live weight

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Other	Total Pounds
May	1,271,595	482,443	1,663,934	4,323	212,865	3,635,160
June	1,738,119	429,624	2,346,149	39,669	439,166	4,992,727
July	1,523,318	406,917	1,311,041	2,978	106,354	3,350,608
August	1,531,911	303,722	1,154,958	6,290	134,748	3,131,629
September	2,281,196	114,196	932,758	19,801	27,335	3,375,286
October	2,315,820	155,073	1,089,536	697	165,086	3,726,212
November	1,822,539	252,796	2,142,192	2,178	139,734	4,359,439
December	2,308,734	232,735	2,280,831	763	85,003	4,908,066
January	3,019,185	118,660	1,544,475	816	1,494	4,684,630
February	3,043,287	126,410	695,512	299	4,281	3,869,789
March	5,132,879	174,019	482,921	129	2,459	5,792,407
April	2,214,685	243,237	977,282	1,502	2,586	3,439,292
TOTAL	**28,203,268**	**3,039,832**	**16,621,589**	**79,445**	**1,321,111**	**49,265,245**

Source: NMFS Statistics Office, dealer weighout database

** May include data from CT vessels without a 2002 Monkfish permit*

B) Landed weight

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Other	Total Pounds
May	568,094	146,182	1,408,575	1,404	151,657	2,275,912
June	768,645	137,234	1,898,292	34,418	301,444	3,140,033
July	604,969	123,368	964,773	1,085	39,166	1,733,361
August	576,869	91,618	814,399	3,144	43,593	1,529,623
September	945,211	34,554	669,487	12,952	8,445	1,670,649
October	1,007,273	50,330	903,383	381	101,477	2,062,844
November	779,272	81,099	1,787,964	922	63,777	2,713,034
December	980,728	77,710	1,965,277	308	28,840	3,052,863
January	1,220,946	38,119	1,389,044	377	567	2,649,053
February	1,164,014	38,504	631,226	117	1,289	1,835,150
March	1,993,588	52,737	403,909	52	741	2,451,027
April	859,859	74,679	826,863	568	778	1,762,747
TOTAL	**11,469,468**	**946,134**	**13,663,192**	**55,728**	**741,774**	**26,876,296**

Table 40 FY2002 monkfish landings (A-live weight, B-landed weight) by month, gear, from dealer reports

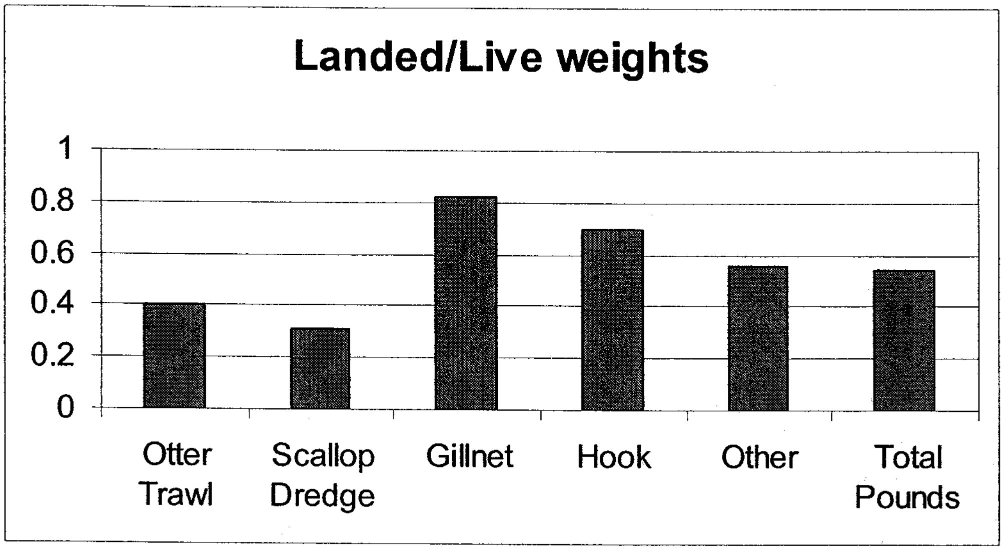


Figure 44 Ratio of landed weight to live weight in NMFS dealer data. Higher ratio indicates greater percentage of whole fish landed, as opposed to tails

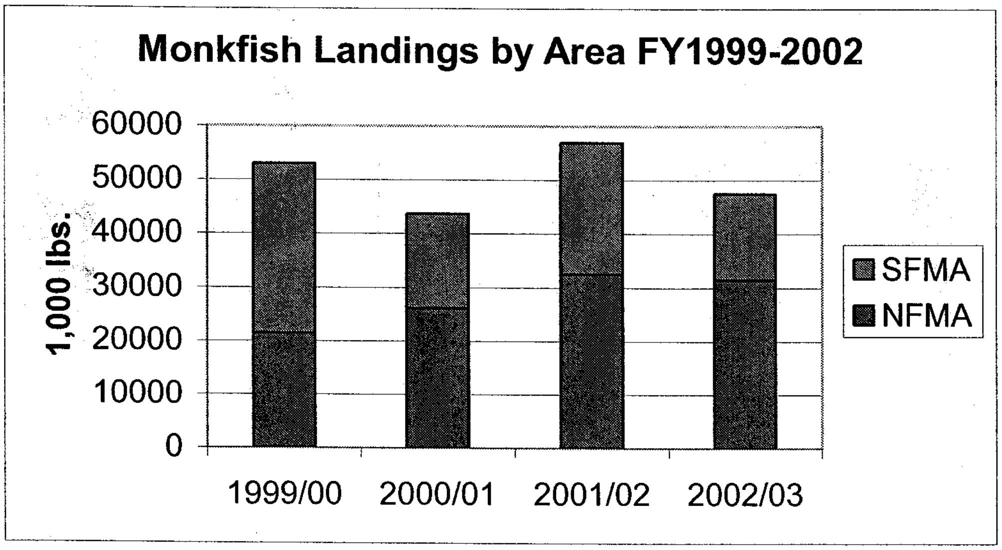
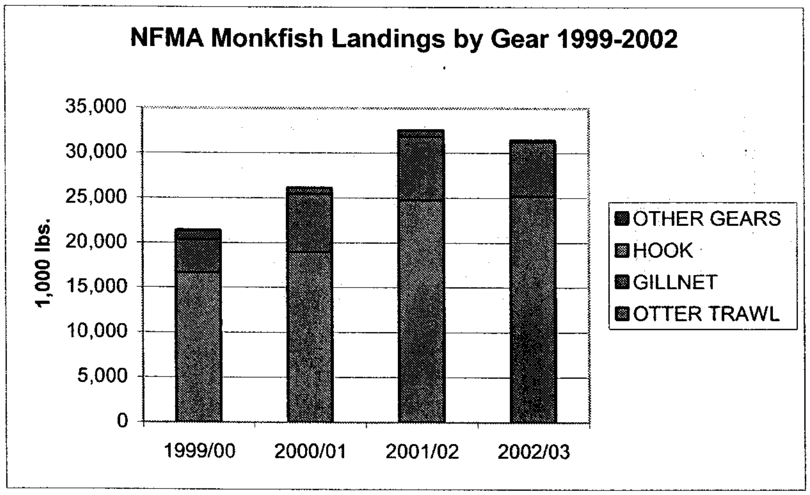


Figure 45 Monkfish landings by management area FY1999-2002

1,000 lbs.	1999/00	2000/01	2001/02	2002/03
NORTHERN	21,429	26,145	32,523	31,436
OTTER TRAWL	16,684	18,977	24,812	25,194
GILLNET	3,640	6,497	7,037	6,042
HOOK	1	1	2	1
OTHER GEARS	1,104	670	672	198
SOUTHERN	31,550	17,549	24,400	16,040
OTTER TRAWL	11,865	7,406	5,981	2,472
GILLNET	15,329	6,955	14,686	11,450
HOOK	2	3	1	2
OTHER GEARS	4,353	3,185	3,732	2,116
ALL AREAS	52,979	43,694	56,923	47,476
OTTER TRAWL	28,549	26,383	30,793	27,666
GILLNET	18,969	13,452	21,723	17,493
HOOK	3	3	3	3
OTHER GEARS	5,457	3,855	4,404	2,314

Table 41 Monkfish landings by gear and management area FY1999-2002



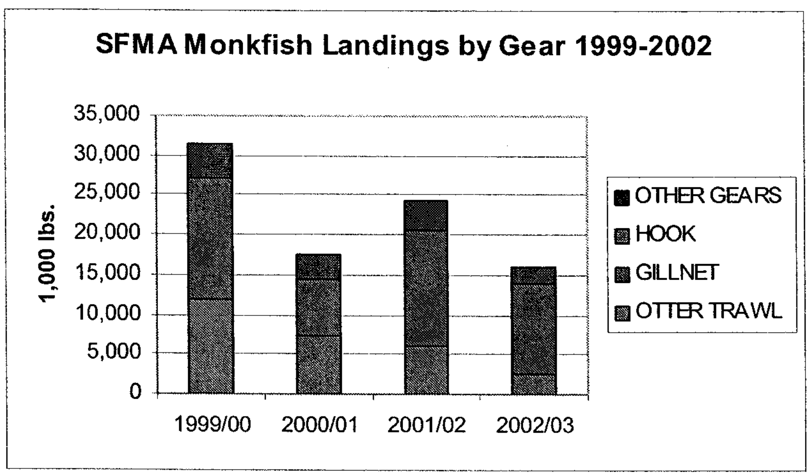


Figure 46 Monkfish landings by area and gear FY1999-2002

	1999/00	2000/01	2001/02	2002/03
NORTHERN				
OTTER TRAWL	78%	73%	76%	80%
GILLNET	17%	25%	22%	19%
HOOK	0%	0%	0%	0%
OTHER GEARS	5%	3%	2%	1%
SOUTHERN				
OTTER TRAWL	38%	42%	25%	15%
GILLNET	49%	40%	60%	71%
HOOK	0%	0%	0%	0%
OTHER GEARS	14%	18%	15%	13%

Table 42 Percentage of total monkfish landings by gear for NFMA and SFMA, FY1999-2002

The landings and revenue data in the following section are presented only for vessels that were issued a federal monkfish permit for FY2001 (for pre-FY2002 data) and FY2002, except Connecticut data that includes all landings. Federal permits for monkfish did not exist prior to implementation of the FMP on November 8, 1999. However, in order to generate a consistent time series of data across fishing years 1995-2001, landings and revenues were only queried for vessels that have permits for the current fishing year.

NOTE: Unless otherwise noted, landings in this section are "landed weights", that is, weight of whole fish, tails and livers landed. These weights are not converted to "live weights" and, thus, do not match landings presented in other sections of this report. For a comparison of landed weights to live weights, see Figure 44. **Also note:** revenue data are based on *fishing year* while in other sections, data are presented for calendar year.

Table 43 reports monkfish landings for the approximately 2,600 vessels issued a monkfish permit (limited access and open access) for the FY2001 and FY2002. Monkfish landings and revenues increased steadily and significantly during 1995-1999, declined in FY2000 and increased in FY2001 to the highest level since 1995. Overall, landings (by "landed weight") increased 41 percent and revenues increased 98 percent from FY 1995 to FY1999, declined by nine and 3.7 percent, respectively, in FY2000. In FY2001, landed weights increased by 30 percent but revenues declined by nine percent, reflecting depressed prices during the year. In FY2002, both landings (landed wts.) and revenues declined about 17 percent due, most likely, to the impact of the lower trip limit.

Fishing Year (May 1 - April 30)	Landings* (1,000 lbs. landed wt.)	Revenues* ($1,000)
1995	18,415.6	$24,758.8
1996	20,732.6	$26,188.5
1997	21,774.3	$30,127.0
1998	24,156.0	$34,682.0
1999	26,077.2	$48,713.7
2000	23,422.8	$46,122.9
2001	31,079.3	$43,122.0
2002	25,816.8	$35,885.1

Source: NMFS Statistics Office, dealer weighout database & permit database

** May include data from CT vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 43 Fishing year 1995-2002 monkfish landings (landed wt.) and revenues for vessels holding a monkfish permit during FY2001 or FY2002.

5.3.2.2.2 Distribution of effort by area fished

Due to issues related to conversion of the Northeast region data collection system that took place in 1994, data were not available to describe the distribution of fishing effort among management areas for any years later than 1993 at the time the EIS for the Monkfish FMP was prepared (see p. 126-129 of the EIS dated 10/23/98). Nevertheless data for calendar year 1993 were examined and the findings are summarized below.

In 1993, 55% of monkfish revenues were derived from Southern Management area landings, of which, three-quarters were delivered to ports in New England states. Vessels operating out of Maine ports concentrated almost exclusively on the Northern area while vessels from Rhode Island and Mid-Atlantic states relied on Southern area. Vessels from Massachusetts were evenly split between the two management areas.

To examine contemporary distribution of effort over the most recent years for which complete logbook data are available (fishing years 1997-2001), activity for vessels holding a 2002 limited access monkfish permit were analyzed. Since separation of monkfish DAS would not affect other monkfish permit categories, vessels with a category A, B, or E permit were excluded. In this manner, a study fleet approach was adopted where activity data over the past 5 years for a common number of permit holders (672) is described.

In the two years prior to FMP implementation in 1999, approximately 85% of the 672 category C and D permit holders landed monkfish whereas the proportion of these vessels that landed at least one pound of monkfish has increased to over 90% in 2000 and 2001. The number of vessels that fished exclusively in the Northern area has increased from 183 in 1997 to 196 in 2001 (Table 42) although the proportion of vessels concentrating on monkfish in the Northern area has not changed very much (32% in most years). By contrast, the number of vessels that landed monkfish exclusively in the Southern area declined from 163 in 1997 to 109 and 130 in 1999 and 2000 respectively. Note that the majority of this change was due to temporary opening of closed Area 2 which would have attracted scallop effort.

On average, vessels that fish exclusively in one area or another tend to be smaller than vessels that fish in both management areas (Table 44) although the difference in average size is less pronounced in the Southern area. Among vessels that rely exclusively in the Northern area, average dependence (the proportion of total landed weight of monkfish to total weight of all species) on monkfish has increased from a low of 7.4% in 1997 to 17.6% in 2001. Compared to vessels that fish in both areas, vessels fishing only in the Northern area were less dependent on monkfish in 1997 and 1998 and more dependent in 2000. However, in 1999 and 2001 there was no significant difference in dependence on monkfish between Northern-only vessels and vessels fishing in both areas. Vessels operating exclusively in the Southern area were more dependent on monkfish than vessels fishing in both areas from 1998 to 2000, but like the Northern-only vessels there was no significant difference in 2001.

From 1997 to 1999 Northern area monkfish landings were nearly evenly split between Northern-only vessels and vessels fishing both areas even though the former accounted for about 70% of total trips (Table 45). In 2000 and 2001, even though the proportion of trips did not change, the relative share of landings by Northern-only vessels increased to nearly two-thirds. The proportion of Southern area landings by Southern-only vessels has been more varied and has fluctuated between 40 and 54% although the number of trips has been less variable (ranging from 57 to 67%).

Among vessels that fish in both areas, dependence on monkfish from the Northern management areas has been increasing over time from about 40% in 1997 to 47% in 2001 (Figure 47). Note that not all vessels fishing in both areas have increased their dependence on Northern area monkfish as dependence at the 5th and 10th percentiles (i.e. vessels that are least dependent on the Northern area) has changed very little. Similarly, dependence on the Northern area has increased only modestly for vessels that have historically fished mostly in the Northern area (i.e. at and above the 90th percentile). Thus, dependence on the Northern area has changed relatively less for the 20% of vessels (about 50 vessels) at the upper and lower end of the Northern area dependence spectrum. The remaining 200 or so vessels have experienced varying degrees of increased dependence on monkfish coming out of the Northern area.

As noted previously, the proportion of vessels fishing in both management areas increased in both 1999 and 2000 which corresponded with special access programs to groundfish closed areas for scallop vessels. This effect is evident in the types of permits held by the study fleet of monkfish category C and D permit holders. Specifically, the number of limited access scallop permit holders that landed monkfish exclusively in the Southern area dropped from 74 in 1998 to 13 and 46 in 1999 and 2000 respectively and back up to 78 in 2001 (Table 46). Note that there was a corresponding increase in the number of scallop permit holders that fished in both areas so the reduction in Southern-only scallop vessels was due to an effort change and not to a reduction in scallop vessel participation in the monkfish fishery. As was the case in 1993, the majority of vessels that land monkfish only in the Northern area were almost exclusively groundfish permit holders.

Compared to vessels that fish in both areas, proportionally more vessels that fished for monkfish exclusively in one management area used gillnet gear as the primary gear when fishing for monkfish (Table 47). Note that this difference was evident in all years except for the Northern area in 2001. For vessels fishing exclusively in the Northern area proportionally more vessels used trawl gear (statistically significant difference in all years except 1998) and proportionally fewer vessels used scallop dredge gear (significant in all years) than primary gears used by vessels that fish in both areas. In the Southern area, proportionally fewer vessels that fished exclusively in the Southern area used trawl gear (statistically significant difference in all years except 1999) compared to vessels that fished in both areas. The proportion of vessels using scallop dredge gear exclusively in the Southern area was no different than that of vessels fishing in both areas in 1997 and 2000; was lower in 1999; and was higher in both 1998 and 2001.

Exclusive reliance on monkfish from one management area from 1997 to 2001 was similar to what had been observed in 1993. Specifically, very few vessels with a Maine home port fished monkfish outside the Northern management area (Table 48). Similarly, New Hampshire vessels either fish only in the Northern area (70 to 80%) or in both areas but do not fish exclusively in the Southern management area. About half of Massachusetts vessels fished in both management areas but of the vessels that did operate in only one management area the majority fished in the Northern area. Overall, only 10% of Massachusetts vessels operated exclusively in the Southern area. The majority of vessels in both Rhode Island and Connecticut fish in both management areas (about 50% in the former and 60% in the latter). Unlike Massachusetts vessels, however, vessels from these two states that do fish in only one area, with few exceptions, fish in the Southern area. For vessels with a home port in most Mid-Atlantic states the majority (two-thirds in most instances) fish exclusively in the Southern area.

	Fish in NMA Only			Fish in SMA Only			Fish in Both Areas		
	Number of Vessels	Average Length	Average Dependence	Number of Vessels	Average Length	Average Dependence	Number of Vessels	Average Length	Average Dependence
1997	184	54.54*	7.4%*	163	68.72*	16.5%	223	74.75	17.6%
1998	183	54.74*	8.7%*	164	68.91*	21%*	230	74.73	15.4%
1999	170	55.16*	11.8%	109	60.46*	25.1%*	309	75.63	13.4%
2000	199	56.61*	16.8%*	132	64.77*	18.0%*	274	74.57	12.7%
2001	196	56.06*	17.6%	170	68.24*	19.5%	243	72.50	15.6%

* Denotes statistically significant at the .05 level

Table 44 Number of vessels, average length and dependence on monkfish by area fished

	Fish in NMA Only		Fish in Both Areas		Fish in SMA Only		Fish in Both Areas	
	NMA Landings	NMA Trips	NMA Landings	NMA Trips	SMA Landings	SMA Trips	SMA Landings	SMA Trips
1997	47.5%	72.3%	52.5%	27.7%	40.7%	64.9%	59.3%	35.1%
1998	52.9%	70.4%	47.1%	29.6%	53.8%	67.1%	46.2%	32.9%
1999	48.7%	65.8%	51.3%	34.2%	48.9%	56.6%	51.1%	43.4%
2000	64.0%	68.1%	36.0%	31.9%	40.8%	57.8%	59.2%	42.2%
2001	66.6%	68.1%	33.4%	31.9%	51.7%	61.3%	48.3%	38.7%

Table 45 Landings and trips in NFMA and SFMA by area fished

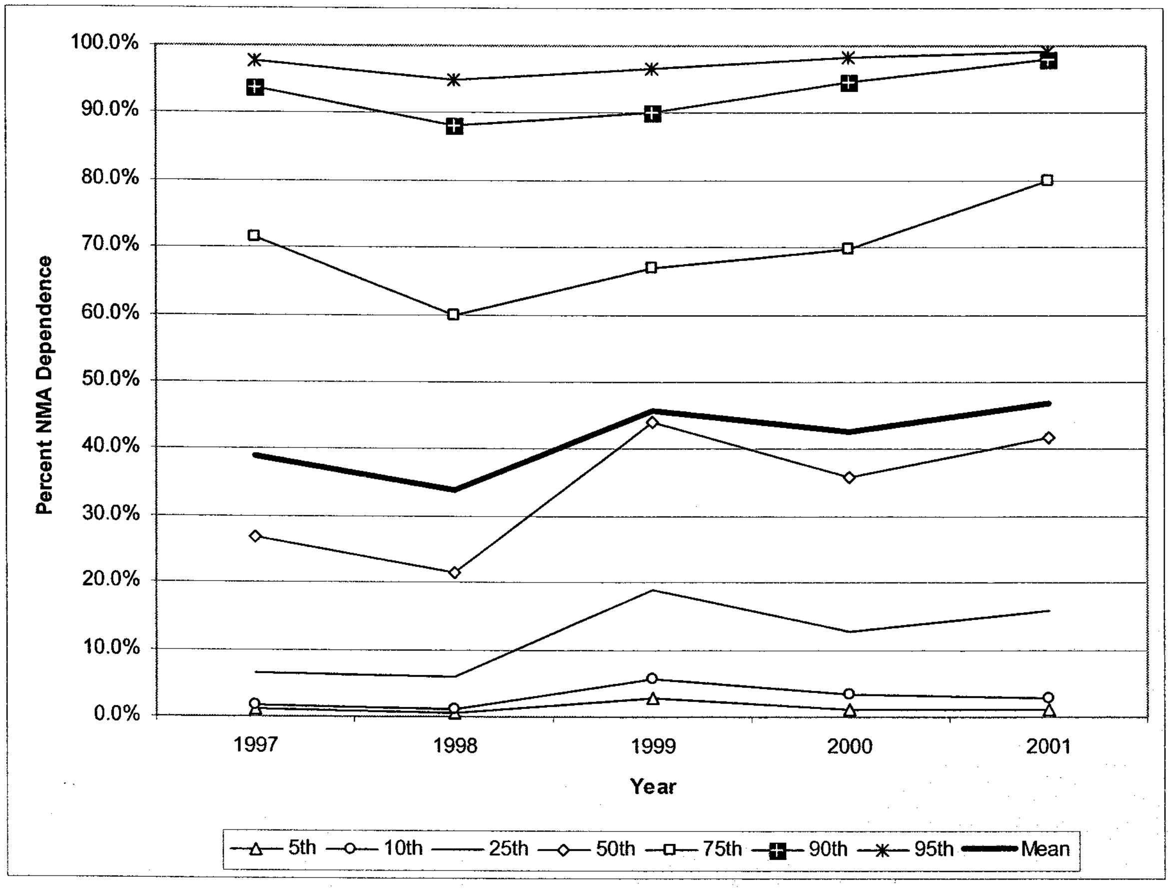


Figure 47 Dependence on NFMA monkfish on vessels fishing for monkfish in both areas

	Fish in NMA Only		Fish in SMA Only		Fish in Both Areas	
	Scallop Permit	Groundfish Permit	Scallop Permit	Groundfish Permit	Scallop Permit	Groundfish Permit
1997	15	172	66	110	79	110
1998	11	177	74	98	80	98
1999	5	168	13	102	150	102
2000	6	194	46	95	118	95
2001	2	195	78	107	80	107

Table 46 Permits held by area fished

	1997	1998	1999	2000	2001
NMA-Only					
Gillnet	24.6%	25.6%	22.9%	26.8%	23.5%
Trawl	68.7%	70.6%	75.9%	71.2%	75.5%
Dredge	6.7%	3.9%	1.2%	2.0%	1.0%
SMA-Only					
Gillnet	20.1%	22.2%	41.3%	31.0%	26.2%
Trawl	45.9%	37.0%	52.9%	37.2%	31.5%
Dredge	34.0%	40.7%	5.8%	31.8%	42.3%
Both Areas					
Gillnet	10.5%	9.3%	9.5%	10.9%	17.7%
Trawl	57.7%	63.1%	48.8%	50.4%	55.1%
Dredge	31.8%	27.6%	41.7%	38.7%	27.2%

Table 47 Primary gear used by area fished (shaded cells not statistically significant)

	Fish in Both Areas					Fish in NFMA Only					Fish in SFMA Only				
HPST	**1997**	**1998**	**1999**	**2000**	**2001**	**1997**	**1998**	**1999**	**2000**	**2001**	**1997**	**1998**	**1999**	**2000**	**2001**
CT	6	7	7	8	7	2	0	0	0	0	3	4	4	3	4
MA	147	151	176	160	160	113	112	104	126	119	33	35	19	21	35
ME	8	7	10	12	4	48	50	47	49	57	1	1	0	0	0
NC	4	6	13	11	7	1	0	0	1	1	13	11	8	10	13
NH	5	4	5	3	6	13	14	14	16	15	0	0	0	1	0
NJ	6	4	25	19	7	3	3	0	0	0	38	41	24	33	46
NY	9	12	12	11	12	0	1	1	1	2	25	21	22	23	21
RI	24	31	34	33	34	3	2	2	4	0	33	28	27	26	29
VA	11	5	20	10	4	0	0	0	1	0	11	17	3	12	15
Other	3	3	7	7	2	1	1	2	1	2	6	6	2	3	7

Table 48 Homeport state by area fished

5.3.2.2.3 Landings and revenues by permit and vessels size class

Monkfish landings and revenues, and the percent of total landings and revenues for those vessels, are reported in Table 49 and Table 50 based on vessels' monkfish permit category in FY2001 and FY2002. As expected, Category A and Category B vessels are the most dependent on monkfish revenues since those vessels, by definition, do not have either a scallop or multispecies limited access permit. In FY2002 Category A and B vessels depended on monkfish for 49 percent and 54 percent, respectively, compared to 7.6 percent and 17 percent on Category C and D. For Category E (open access) vessels, less than one percent of landings and less than two percent of revenues on those vessels came from monkfish in years FY1995 through FY2002.

Monkfish Permit Category	1,000 pounds, landed weight							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
A	453	817	563	1,093	1,277	845	1,152	1,074
% of Total A Landings	49.1%	54.1%	13.4%	10.0%	20.5%	6.5%	6.8%	6.4%
B	322	583	479	992	1,474	1,050	2,084	1,593
% of Total B Landings	14.0%	18.2%	23.4%	24.1%	36.9%	30.2%	46.4%	40.6%
C	11,504	12,322	12,364	12,144	11,876	10,583	13,289	11,169
% of Total C Landings	10.4%	9.3%	7.5%	8.2%	8.5%	6.9%	6.6%	8.8%
D	4,094	5,020	6,139	7,509	8,982	8,905	12,154	10,469
% of Total D Landings	4.6%	5.3%	5.8%	6.7%	11.1%	9.7%	11.7%	9.9%
E (Open Access)	1,014	1,257	1,637	1,845	1,911	1,459	1,823	1,512
% of Total E Landings	0.5%	0.6%	0.5%	0.6%	0.8%	0.6%	0.7%	0.7%
CT	1,029	733	592	574	557	580	577	0
% of Total CT Landings	5.7%	4.0%	3.3%	3.5%	2.9%	3.3%	5.8%	0.0%
TOTAL MONK LANDED	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 49 Monkfish Landings, 1995-2002, as a percentage of total landings by permit category for vessels issued a monkfish permit during FY2001 and FY2002

Monkfish Permit Category	$1,000, nominal (not discounted)							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
A	$582	$849	$663	$1,262	$2,011	$1,428	$1,615	$1,441
% of Total A Revenues	36.9%	41.4%	35.7%	51.2%	63.5%	46.6%	50.6%	48.9%
B	$391	$583	$552	$1,183	$2,528	$1,699	$2,828	$2,097
% of Total B Revenues	24.6%	33.5%	38.7%	49.6%	62.2%	48.1%	60.3%	54.0%
C	$16,014	$16,423	$18,091	$18,501	$23,250	$22,380	$18,293	$15,735
% of Total C Revenues	13.0%	12.0%	13.3%	14.0%	13.5%	11.5%	9.3%	7.6%
D	$4,736	$5,649	$7,514	$10,076	$16,043	$16,620	$17,085	$14,555
% of Total D Revenues	8.2%	9.3%	11.2%	14.9%	20.4%	19.9%	20.1%	17.0%
E (Open Access)	$1,263	$1,452	$2,270	$2,642	$3,471	$2,848	$2,515	$2,057
% of Total E Revenues	1.1%	1.2%	1.7%	2.1%	2.4%	1.9%	1.6%	1.3%
CT	$1,772	$1,233	$1,036	$1,018	$1,410	$1,148	$786	$0
% of Total CT Revenues	4.1%	2.5%	3.1%	3.0%	3.6%	3.8%	6.0%	0.0%
TOTAL MONK REVENUE	$24,759	$26,188	$30,127	$34,682	$48,714	$46,123	$43,122	$35,885

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 50 Monkfish Revenues, 1995-2002, as a percentage of total revenues by permit category for vessels issued a monkfish permit during FY2001 and FY2002

Monkfish landings and revenues, and the percent of total landings and revenues for those vessels, by vessel length for FY1995-2002 are reported in Table 51 and Table 52, respectively. For the 1995-1998 period, vessels in the 70-89 feet category landed the largest amounts of monkfish and generated the most revenues from monkfish. In FY2000, however, both landings and revenues on vessels in the 30-49 feet category exceeded those of the 70-89 feet category vessels, and has remained the highest class since then. The dependence of 30-49 feet category vessels on monkfish revenues, the size class most dependent on monkfish, has remained around 30 percent of total revenues since FY1999,.

Vessel Length Category	1,000 pounds, landed weight							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
0-29 Feet	70	61	21	20	50	62	73	56
% of Total 0-29 Landings	11.7%	10.5%	3.1%	2.5%	6.9%	7.1%	6.8%	6.0%
30-49 Feet	5,303	6,317	6,415	8,458	10,537	9,291	13,485	12,134
% of Total 30-49 Landings	8.7%	10.3%	10.7%	13.3%	18.5%	17.0%	24.3%	24.2%
50-69 Feet	2,675	3,771	3,398	4,057	4,550	4,983	7,080	5,964
% of Total 50-69 Landings	3.5%	4.7%	3.2%	4.7%	5.5%	5.9%	8.6%	7.6%
70-89 Feet	7,228	8,208	9,629	9,217	8,904	7,469	8,510	6,989
% of Total 70-89 Landings	4.0%	4.4%	3.6%	3.8%	4.0%	3.4%	3.6%	3.3%
90+ Feet	2,109	1,643	1,718	1,830	1,480	1,038	1,353	674
% of Total 90+ Landings	2.1%	1.3%	1.2%	1.1%	1.2%	0.7%	0.6%	0.5%
CT	1,029	733	592	574	557	580	577	0
% of Total CT Landings	5.7%	4.0%	3.3%	3.5%	2.9%	3.3%	5.8%	0.0%
TOTAL MONK LANDED	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 51 Monkfish Landings, FY1995-2002, as a percentage of total landings by vessel length for vessels issued a monkfish permit during the FY2001 and FY2002

Vessel Length Category	$1,000, nominal (not discounted)							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
0-29 Feet	$72	$60	$34	$25	$99	$98	$98	$68
% of Total 0-29 Revenues	8.3%	8.3%	3.3%	2.4%	8.9%	9.4%	8.4%	5.4%
30-49 Feet	$5,657	$6,474	$7,049	$9,933	$16,887	$16,199	$19,009	$16,289
% of Total 30-49 Revenues	13.1%	15.1%	15.4%	20.2%	29.3%	29.3%	31.4%	28.1%
50-69 Feet	$3,524	$4,530	$4,488	$5,718	$8,669	$9,963	$9,968	$8,529
% of Total 50-69 Revenues	7.2%	8.4%	7.7%	10.3%	13.0%	13.6%	13.4%	11.2%
70-89 Feet	$10,548	$11,509	$14,712	$14,957	$18,420	$16,034	$11,489	$10,099
% of Total 70-89 Revenues	7.1%	7.2%	8.6%	8.8%	8.7%	6.8%	4.8%	4.0%
90+ Feet	$3,186	$2,383	$2,808	$3,031	$3,228	$2,682	$1,772	$900
% of Total 90+ Revenues	5.6%	3.8%	4.7%	5.4%	4.9%	3.8%	2.4%	1.3%
CT	$1,772	$1,233	$1,036	$1,018	$1,410	$1,148	$786	$0
% of Total CT Revenues	4.1%	2.5%	3.1%	3.0%	3.6%	3.8%	6.0%	0.0%
TOTAL MONK REVENUE	$24,759	$26,188	$30,127	$34,682	$48,714	$46,123	$43,122	$35,885

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 52 Monkfish Revenues, FY1995-2002, as a percentage of total revenues by vessel length for vessels issued a monkfish permit during the FY2001 and FY2002

Landings and revenues from monkfish and other species as a percentage of total landings and revenues for vessels with a monkfish permit in FY2001 and 2002 are reported in Table 53 and Table 54, respectively. In terms of landings by weight, most (60 percent) of the landings on vessels that land monkfish are species other than monkfish, dogfish, fluke, regulated multispecies, scallops, and skates. "Other species" include squid, herring, shrimp, whiting, and other high volume species.

While "other species" accounted for 60 percent of the total weight of FY2002 landings for vessels with a monkfish permit, they accounted for only 22 percent of the total revenues. The revenue dependence on other species has declined steadily from an average of 46 percent from 1995 to 1997. This is consistent with the lower prices paid (on a per-pound basis) for the high volume species and increased revenues in the latter years from scallop and multispecies fisheries. As a group, monkfish permitted vessels received 44 percent of their revenues from scallops and 21.5 percent from multispecies in FY2002, increasing steadily since FY1995. Even though monkfish contributed only about 8 percent of the total revenues on vessels with monkfish permits in FY2002, it is important to remember that some vessel subgroups (by permit category, size or area) are significantly more dependent on monkfish for their total revenues, as noted in the previous paragraphs.

Species Category	1,000 pounds, landed weight							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Dogfish	33,914	32,392	23,902	34,127	22,942	6,742	4,129	3,644
Dogfish % of Total Landings	7.8%	6.8%	4.0%	5.9%	4.6%	1.3%	0.7%	0.8%
Fluke	7,829	7,941	7,732	9,396	9,478	8,670	11,757	12,090
Fluke % of Total Landings	1.8%	1.7%	1.3%	1.6%	1.9%	1.7%	1.9%	2.5%
Monkfish	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817
Monkfish % of Total Landings	4.2%	4.3%	3.7%	4.2%	5.2%	4.5%	5.1%	5.3%
Other	306,209	329,535	448,958	412,327	334,735	343,322	388,479	290,197
Other % of Total Landings	70.0%	69.0%	75.6%	71.2%	66.5%	65.6%	64.3%	60.1%
Multispecies	47,365	53,830	62,951	67,977	68,654	88,095	103,027	83,647
Multispecies % of Total Landings	10.8%	11.3%	10.6%	11.7%	13.6%	16.8%	17.0%	17.3%
Scallops	14,535	15,852	11,834	12,565	23,332	35,380	48,140	50,953
Scallops % of Total Landings	3.3%	3.3%	2.0%	2.2%	4.6%	6.8%	8.0%	10.6%
Skates	9,134	17,503	16,740	18,756	18,061	17,643	18,020	16,378
Skates % of Total Landings	2.1%	3.7%	2.8%	3.2%	3.6%	3.4%	3.0%	3.4%
TOTAL LBS. LANDED	437,402	477,786	593,890	579,303	503,280	523,275	604,631	482,726

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 53 Landings of monkfish and other species, FY1995-2002, as a percentage of total landings for vessels issued a monkfish permit during FY2001 and FY2002

Species Category	$1,000, nominal (not discounted)							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
Dogfish	$6,610	$6,003	$3,555	$5,876	$4,072	$1,798	$1,110	$872
Dogfish % of Total Revenues	1.9%	1.6%	1.0%	1.6%	0.9%	0.4%	0.2%	0.2%
Fluke	$13,961	$13,243	$14,061	$14,418	$16,148	$13,663	$14,877	$16,631
Fluke % of Total Revenues	4.1%	3.6%	3.8%	3.9%	3.7%	2.9%	3.2%	3.6%
Monkfish	$24,759	$26,188	$30,127	$34,682	$48,714	$46,123	$43,122	$35,885
Monkfish % of Total Revenues	7.3%	7.1%	8.2%	9.5%	11.0%	9.9%	9.4%	7.8%
Other	$159,711	$163,907	$171,432	$152,363	$162,812	$138,606	$120,929	$101,574
Other % of Total Revenues	46.9%	44.5%	46.4%	41.6%	36.9%	29.7%	26.3%	22.1%
Multispecies	$57,323	$60,825	$71,309	$82,758	$83,994	$93,601	$102,609	$99,102
Multispecies % of Total Revenues	16.8%	16.5%	19.3%	22.6%	19.0%	20.1%	22.3%	21.5%
Scallops	$75,624	$92,763	$76,005	$72,999	$122,812	$169,409	$174,760	$202,704
Scallops % of Total Revenues	22.2%	25.2%	20.6%	19.9%	27.8%	36.3%	37.9%	44.1%
Skates	$2,708	$5,440	$3,071	$3,471	$3,234	$3,598	$3,116	$3,373
Skates % of Total Revenues	0.8%	1.5%	0.8%	0.9%	0.7%	0.8%	0.7%	0.7%
TOTAL LBS. LANDED	$340,696	$368,369	$369,559	$366,568	$441,785	$466,797	$460,523	$460,141

Source: NMFS Statistics Office, dealer weighout database

** CT data may include landings from vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 54 Revenues from monkfish and other species, FY1995-2002, as a percentage of total revenues for vessels issued a monkfish permit during FY2001 and FY2002

5.3.3 Ports and Communities

Table 55 presents 1995-2002 landings (in landed weights) of monkfish for vessels issued a monkfish permit for FY2001 or FY2002 by the vessels' homeport state. Vessels homeported in Massachusetts clearly dominated monkfish landings, followed by vessels from Rhode Island, New Jersey, and Maine. In FY2002, all states saw a decline in monkfish landings (landed weights) on vessels homeported in each state.

Massachusetts ports have accounted for the largest quantity of monkfish revenues in every year from 1982 through 2002 (Table 56, calendar year data). Due to changes in data collection methods over time data for New York was not added until 1986, while the states of Connecticut and Delaware were added in 1989. North Carolina data were not collected until 1997. Since 1997, Massachusetts landings accounted for at least 40% of total revenues but the State's share of total revenue has declined slightly since 1999. By contrast, revenue shares in the states of Maine, New Hampshire, and New Jersey increased somewhat over the past two years compared to the revenues earned prior to 1999.

There are only ten ports that have had a long-term involvement in the monkfish fishery at a relatively high level, that is, where monkfish were landed every year between 1982 and 2002 and that were among the top twenty ports in terms of monkfish value in every single year. These ten ports were identified by ranking all ports and summing across all years for ports that had reported landings in every year. This means that any port with a cumulative ranking score less than or equal to 420 would be in the top 20 in each of the past 21 years and the port with the lowest score would be the top ranked port. Since some states were added to the dealer weighout database in different years a similar ranking of ports was conducted for the period 1989 to 2002 and 1997 to 2002 where the latter is the longest time series over which ports in all states (including North Carolina) could be included.

STATE	Thousands of Pounds of Monkfish							
	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
CT*	1,029	733	592	574	557	603	1,337	957
MA	10,023	8,955	9,893	11,353	11,167	10,643	12,305	10,690
MD	178	524	382	322	341	107	158	38
ME	1,815	1,932	2,102	1,986	3,193	3,993	5,012	4,963
NC	0	431	445	395	432	166	167	116
NH	329	401	523	452	801	1,477	1,928	1,233
NJ	1,414	2,321	2,680	3,903	4,371	2,825	5,261	3,893
NY	248	513	654	775	573	435	709	681
RI	2,829	4,080	3,732	3,597	3,969	2,720	3,519	2,814
VA	550	841	773	799	671	455	683	431
TOTAL	18,416	20,733	21,774	24,156	26,077	23,423	31,079	25,817

Source: NMFS Statistics Office, dealer weighout database & permit database

** May include data from CT vessels without a 2001 or 2002 Monkfish permit*

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 55 Landed weight of monkfish by state for fishing years 1995-2002, for vessels issued a federal monkfish permit in FY2001 or FY2002 (except CT, which may include vessels not issued a federal permit).

	CT	DE	MA	MD	ME	NC	NH	NJ	NY	RI	VA
1982	-	-	0.99	0.01	0.58	-	0.07	0.20	-	0.71	0.26
1983	-	-	0.82	0.01	0.64	-	0.09	0.21	-	0.71	0.32
1984	-	-	1.00	0.01	0.68	-	0.14	0.23	-	0.85	0.23
1985	-	-	1.83	0.02	0.85	-	0.09	0.25	-	0.92	0.30
1986	-	-	3.48	0.02	1.38	-	0.14	0.21	0.20	1.13	0.29
1987	-	-	3.96	0.01	2.95	-	0.25	0.27	0.31	1.43	0.46
1988	-	-	4.90	0.02	2.43	-	0.29	0.26	0.26	1.62	0.37
1989	0.10	0.00	7.63	0.01	2.10	-	0.26	0.34	0.25	1.81	0.31
1990	0.08	0.00	7.59	0.01	1.90	-	0.14	0.54	0.28	2.22	0.42
1991	0.49	0.00	9.70	0.02	2.98	-	0.17	1.47	0.32	5.83	0.78
1992	0.65	0.00	8.23	0.02	3.19	-	0.14	1.78	0.49	5.23	0.99
1993	0.45	0.00	9.80	0.01	4.68	-	0.17	1.73	0.53	3.60	0.73
1994	0.59	0.00	14.34	0.09	4.66	-	0.39	1.51	0.49	3.62	0.45
1995	1.94	0.11	19.94	0.44	4.71	-	0.74	2.65	0.45	4.10	0.91
1996	1.55	0.02	15.82	0.43	4.57	-	0.81	2.70	1.03	4.59	0.76
1997	1.15	0.00	15.31	0.54	4.09	0.75	0.80	4.11	1.26	5.95	1.03
1998	1.00	0.00	15.81	0.40	3.13	0.54	0.67	5.81	1.25	4.09	1.08
1999	0.79	0.00	21.85	0.38	5.21	0.59	1.71	7.78	1.15	6.65	0.94
2000	1.56	0.00	24.12	0.27	8.88	1.06	2.71	6.51	0.91	6.89	0.84
2001	1.20	0.00	18.26	0.14	7.99	0.21	2.81	6.13	1.29	5.45	0.70
2002	0.79	0.00	15.57	0.14	6.25	0.20	1.85	5.90	1.25	4.76	0.70

Table 56 Monkfish revenues by state, 1982-2002, calendar year. ($millions)

Given the two criteria of top-20 in landed value and having some reported landings in every year means that some ports may be eliminated if either criterion is not met over a specified time period. For the three different time periods examined herein only seven ports appeared in the port rankings each time. These ports were New Bedford, Portland, Point Judith, Gloucester, Newport, Point Pleasant, and Chatham (Table 57). Over the past 21 years these seven ports (all of which are located in either Maine, Massachusetts, Rhode Island, or New Jersey) accounted for at least 50% of total monkfish value in every year and averaged 60% of total revenues over the past six years (Table 58). Based on more recent and more complete data (1997-2002), ports from Maine, Massachusetts, and Rhode Island remain dominant in the monkfish fishery but at least one port was identified in every state except, Delaware, Maryland, and Virginia.

The discussion presented in this section is based on a select group of ports identified as primary ports. These ports were drawn from an evaluation of both weighout port landings and homeport landings value data following the *primary* and *secondary* port criteria used in the initial fishery management plan and subsequently in annual SAFE report analysis. Primary ports for this and earlier analysis are considered to be ports with average landings value for the periods 1994-1997 and 1999-2002 above $1,000,000 (Table 59), while secondary ports are those showing average annual landings value of $50,000 to $1,000,000

The discussion provided in this section combines the results from the homeport and weighout port analysis by including all ports that qualified as primary ports. It additionally includes five top producing secondary ports with landings value in excess of $800,000 that were found to be highly dependent on monkfish relative to the total value of all species landed. Data by dealer weighout port value showed some shifts in port rankings for these two time periods. New Bedford, MA, Portland, ME, and Gloucester, MA were ranked first, second, and fourth place for both time periods. Barnegat Light, NJ rose from sixth to third place while Point Judith, RI fell from third to fifth and Boston, MA from fifth to seventh place. The number of ports with four year average landings above $1,000,000 rose from six (New Bedford, Gloucester, Boston, MA; Portland, NH; and Barnegat Light/ Long Beach, NJ; and Point Judith, RI) totaling $23,485,704 for the 1994-1997 period to eight for the 1998-2001 period (adding Point Pleasant, NJ and Portsmouth, NH) totaling $33,496,244. Notable increases in landings value between the two periods were found for Portland, ME; Barnegat Light, Point Pleasant, NJ; Gloucester, MA; and Portsmouth, NH.

	Rank		
	1982-2002	1989-2002	1997-2002
New Bedford, MA	1	1	1
Portland, ME	2	2	2
Point Judith, RI	3	3	4
Gloucester, MA	4	4	5
Newport, RI	5	6	9
Cape May, NJ	6	9	
Point Pleasant, NJ	7	7	6
Chatham, MA	8	11	16
Hampton, VA	9		
Provincetown, MA	10		
Long Beach, NJ		5	3
Hampton Bay, NY		8	10
Fall River , MA		10	
Portsmouth, NH		12	8
Boston, MA			7
Stonington, CT			11
Little Compton, RI			12
Westport, MA			13
Tiverton, RI			14
Port Clyde, ME			15
Wanchese, NC			17
Scituate, MA			18

Table 57 Long-term rankings of top monkfish ports, by revenues, 1982-2002

Port	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
NEW BEDFORD, MA	90	107	194	734	2,051	2,400	3,530	6,182	5,622	7,256	6,455	6,912	8,355	12,650	10,067	11,583	12,291	14,818	13,291	10,099	6,568
PORTLAND, ME	174	197	271	413	855	2,092	1,783	1,664	1,432	2,154	2,265	3,858	3,809	4,156	4,078	3,599	2,491	3,931	6,898	6,363	4,991
LONG BEACH, NJ	0	0	0	0	17	36	51	73	144	345	341	519	644	1,522	1,626	1,943	3,020	4,333	3,973	4,090	3,870
POINT JUDITH, RI	328	410	513	642	766	947	879	755	1,100	4,198	3,710	1,850	1,935	2,307	3,271	4,172	2,316	3,113	3,753	3,095	2,316
GLOUCESTER, MA	501	339	465	748	857	926	780	686	935	949	872	1,433	1,892	2,425	1,807	1,050	1,175	2,925	4,619	4,216	4,329
POINT PLEASANT, NJ	50	51	17	30	52	57	72	59	89	122	174	298	286	550	571	1,353	2,152	2,913	1,902	1,552	1,587
BOSTON, MA	0	0	0	0	1	1	68	70	4	0	2	3	1,034	1,897	1,440	1,398	1,144	1,890	2,647	1,247	1,516
PORTSMOUTH, NH	0	0	0	0	0	0	0	1	0	38	108	142	336	694	754	741	597	1,359	2,163	2,242	1,377
NEWPORT, RI	313	290	328	273	345	468	723	962	1,105	1,501	1,146	813	727	436	458	677	598	1,220	1,093	694	805
HAMPTON BAY, NY	0	0	0	0	75	107	144	65	75	170	249	385	280	186	680	691	796	760	686	936	754
STONINGTON, CT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	939	866	624	1,462	656	294
LITTLE COMPTON, RI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	648	837	1,002	617	713
TIVERTON, RI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	509	1,418	926	690	753
PORT CLYDE, ME	0	0	0	0	0	0	0	67	0	197	234	188	216	144	169	193	297	550	637	692	505
CHATHAM, MA	46	33	49	58	118	209	168	143	172	212	137	137	240	301	210	159	241	350	774	506	1,005
WANCHESE, NC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	534	519	527	1,010	174	158
SCITUATE, MA	3	4	5	22	69	93	43	45	80	79	11	6	57	78	55	60	279	559	927	436	463
WESTPORT, MA	0	0	0	0	0	0	0	0	0	1	24	70	280	785	568	515	333	651	826	583	553
OTHER	1,308	1,372	1,303	1,345	1,641	2,311	1,903	2,027	2,418	4,530	4,984	5,085	6,046	7,871	6,530	5,101	3,514	4,278	5,160	5,306	4,863
TOTAL	2,812	2,803	3,144	4,266	6,847	9,647	10,144	12,799	13,178	21,750	20,709	21,699	26,136	36,001	32,284	34,983	33,787	47,056	53,751	44,194	37,419

Table 58 Value (in $1,000s) of monkfish at 18 ports, 1982-2002.

State	Weighout port	1994	1995	1996	1997	94-97 Ave.	Rank	1999	2000	2001	2002	99-02 Ave	Rank
MA	NEW BEDFORD	8,354,978	12,649,556	10,066,892	11,582,790	10,663,554	1	14,817,704	13,290,773	10,098,665	6,567,550	11,193,673	1
ME	PORTLAND	3,808,962	4,155,643	4,077,642	3,598,869	3,910,279	2	3,930,590	6,898,445	6,362,710	4,990,587	5,545,583	2
RI	POINT JUDITH	1,935,215	2,306,957	3,271,140	4,172,223	2,921,384	3	3,112,997	3,752,758	3,095,247	2,315,556	3,069,140	5
MA	GLOUCESTER	1,891,754	2,424,811	1,806,593	1,050,336	1,793,374	4	2,924,883	4,619,082	4,215,528	4,328,985	4,022,120	4
MA	BOSTON	1,034,367	1,896,661	1,439,569	1,397,836	1,442,108	5	1,889,944	2,647,061	1,247,044	1,516,002	1,825,013	7
NJ	BARNEGAT LIGHT	643,873	1,522,436	1,626,209	1,943,018	1,433,884	6	4,333,180	3,973,119	4,090,454	3,870,007	4,066,690	3
NJ	POINT PLEASANT	285,688	550,131	570,970	1,352,620	689,852		2,913,175	1,902,120	1,552,085	1,587,001	1,988,595	6
NH	PORTSMOUTH	335,572	694,405	754,277	740,821	631,269		1,359,427	2,163,205	2,242,047	1,377,046	1,785,431	8
						23,485,704						33,496,244	

Note: This table includes all ports with reported landings in at least one year from 1994 to 1997 and from 1998 to 2001. Weighout values are listed by weighoutport for permitted vessels. Non-federal permit/no ID category are those landings values reported by federal dealers for non-federal permit holders or where not identification was reported. This includes Connecticut landings values otherwise underreported in this analysis. Can not report value related information for ports with fewer than four active vessels. Barnegat Light, Barnegat, and Long Beach, NJ are combined. Source: Calendar year weighout data.

Table 59 Primary port comparison of pre-FMP (1994-1997) and post-FMP (1999-2002) landings values ($) for primary ports identified in the original FMP or subsequently meeting the primary port criteria.

Port level activity for monkfish landings in pounds relative to all other species landed is related to port size and the species diversification of ports. Westport, MA, Tiverton, RI, Little Compton, RI, and Barnegat Light, NJ all show a dependency on monkfish landings in excess of 40% of total species landed (Table 60). Less species diversified, more specialized ports such as these are potentially more reactive to changes in the monkfish fishery than other ports such as Point Judith, RI that is more species diversified. Nine of the fifteen ports (Westport, Fairhaven, Boston, Chatham, and Gloucester, MA; Tiverton and Little Compton, RI; Barnegat Light, NJ; Port Clyde and Portland, ME) evaluated show an increasing dependency on monkfish in pounds. Fairhaven and New Bedford, MA show decreasing activity due in part to improved conditions in the scallop fishery. Port level dependency contrasts with port level production of monkfish for the primary producing ports (Table 61). While the most dependent ports, in pounds, tend to be smaller ports, larger ports are the producers of the greatest quantities of monkfish.

State	Homeport	1997	1998	1999	2000	2001	Ave.
MA	WESTPORT	55%	54%	66%	70%	61%	61%
RI	TIVERTON	26%	47%	63%	45%	72%	51%
RI	LITTLE COMPTON	45%	47%	44%	42%	51%	46%
NJ	BARNEGAT LIGHT	32%	38%	50%	46%	57%	44%
MA	FAIRHAVEN	36%	37%	29%	17%	20%	28%
RI	NEWPORT	16%	22%	28%	18%	20%	21%
ME	PORT CLYDE	13%	16%	19%	24%	26%	20%
NJ	POINT PLEASANT	14%	22%	20%	20%	19%	19%
MA	BOSTON	13%	18%	19%	18%	18%	17%
NH	PORTSMOUTH	9%	7%	14%	20%	29%	16%
MA	CHATHAM	8%	8%	12%	22%	24%	15%
MA	GLOUCESTER	8%	8%	13%	21%	19%	14%
MA	NEW BEDFORD	21%	20%	11%	8%	8%	14%
ME	PORTLAND	7%	8%	15%	14%	16%	12%
RI	POINT JUDITH	6%	5%	5%	5%	5%	5%

Note: only includes ports with average (1999-2002) landings value in excess of $1,000,000 for either homeport or weighout port and select highly dependent ($) ports with average landings valı in excess of $800,000. Base measurement is pounds landed by homeport. Percent values are weighted within port. Data source: logbooks.

Table 60 Port Level Landings Activity for Monkfish as a Percentage of Total Pounds Landed

Homeport	1997	1998	1999	2000	2001	Ave.
BOSTON	3,120,275	3,844,657	4,221,916	3,407,539	3,748,884	3,668,654
NEW BEDFORD	4,376,436	4,329,465	3,015,468	2,670,653	3,574,212	3,593,247
BARNEGAT LIGHT	819,892	1,486,927	1,661,085	1,175,117	2,145,032	1,457,611
GLOUCESTER	685,442	769,365	1,273,418	1,736,545	1,823,630	1,257,680
PORTLAND	441,526	460,030	1,019,863	1,012,746	1,271,608	841,155
POINT JUDITH	893,737	751,284	765,534	576,671	460,958	689,637
WESTPORT	581,765	548,134	536,200	528,532	671,004	573,127
NEWPORT	353,809	478,854	804,735	463,521	616,939	543,572
CHATHAM	220,541	285,743	351,809	625,771	681,309	433,035
PORTSMOUTH	230,226	202,657	367,036	469,916	751,024	404,172
TIVERTON	247,575	199,780	401,312	208,618	520,996	315,656
POINT PLEASANT	290,856	530,852	352,166	161,159	133,136	293,634
FAIRHAVEN	278,762	325,136	210,425	217,708	400,625	286,531
PORT CLYDE	177,741	173,563	245,874	342,768	464,790	280,947
LITTLE COMPTON	218,808	168,084	140,373	132,100	256,832	183,239
Total	12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896

Note: only includes ports with average (1999-2002) landings value in excess of $1,000,000 for either homeport or weighout port and select highly dependent ($) ports with average landings value in excess of $800,000. Base measurement is pounds landed by homeport. Data source: logbooks.

Table 61 Port Level Production of Monkfish in Pounds

For the primary producing ports, gillnets are the main gear used in landing monkfish approaching 40% of monkfish landings across all vessel size classes. Thirty percent of monkfish landings are from small vessels (Table 62). For these ports only medium and large vessels in Boston, Fairhaven, and New Bedford, MA; Portsmouth, NH; and Barnegat Light and Point Pleasant, NJ fished monkfish using scallop dredge gear. Small vessels using gillnets to land monkfish are the most common gear across ports (Table 63).

Average of dep		year					
Vessel Size	monkgear	1997	1998	1999	2000	2001	Ave.
L	Gill	2%	27%	52%	41%	60%	40%
	Dredge	28%	25%	10%	5%	6%	14%
	Other	14%	9%	6%	2%	0%	10%
	Trawl	12%	14%	14%	11%	9%	12%
M	Gill	21%	23%	33%	43%	55%	37%
	Dredge	23%	22%	8%	4%	4%	12%
	Other	3%	3%	8%	8%	0%	5%
	Trawl	7%	8%	10%	9%	10%	9%
S	Gill	24%	30%	42%	46%	52%	39%
	Other	0%	0%	0%	0%	0%	0%
	Trawl	8%	11%	10%	15%	15%	12%
L Average		0.18	0.18	0.13	0.09	0.09	0.13417
M Average		0.1	0.1	0.12	0.14	0.16	0.12519
S Average		0.18	0.24	0.32	0.37	0.41	0.30835

*Vessel size classes: L> 70 feet, M= 50-70 feet, S<50 feet

Table 62 Primary Producing Port Dependency on Monkfish Relative to Vessel Size Class and Gear Used

In terms of tonnage, groundfish and small mesh multispecies are the highest producing of the four primary species evaluated for both large and medium vessel classes with monkfish a tertiary species. Scallops rank third and fourth for these vessel classes. Smaller vessels produce a more equitable balance of groundfish and monkfish (Table 64). At the port level, Boston, Gloucester, and New Bedford, MA; Portland, ME; and Portsmouth, NH are larger ports showing primary tonnage activity coming from groundfish with Chatham, MA; Newport, RI; and Port Clyde, ME smaller ports with high volume activity (Table 65). Ports where monkfish represents the highest volume of activity relative to the other primary species evaluated include Little Compton, Westport, and Tiverton, RI; and Barnegat Light, NJ. While groundfish received the highest overall ranking (27) in importance of groundfish to port volume production, scallop received the lowest (53). This indicates the importance of the volume of landings in homeports. The value per pound of specific species (e.g., in 1999 prices ($): monkfish - 0.85, haddock – 1.31, and whiting - 0.46 relative to scallops 5.50) is considered separately for primary and secondary ports in the affected human environment section of this document.

Average of dependency				YEAR					
HPST	Home Port	VSIZE	Gear	1997	1998	1999	2000	2001	Total
MA	BOSTON	L	Gill	1%	1%	47%	64%	75%	37%
			Dredge	21%	44%	14%	7%	6%	15%
			Other	18%	0%	16%	0%	0%	17%
			Trawl	13%	18%	18%	12%	12%	15%
		M	Gill	9%	7%	26%	55%	45%	31%
			Trawl	7%	12%	13%	11%	12%	11%
		S	Gill	27%	36%	40%	40%	52%	39%
			Trawl	10%	11%	12%	22%	18%	15%
	BOSTON Average			13%	18%	19%	18%	18%	17%
	CHATHAM	M	Gill	1%	1%	1%	28%	34%	13%
		S	Gill	11%	11%	19%	25%	28%	20%
			Trawl	6%	7%	5%	7%	5%	6%
	CHATHAM Average			8%	8%	12%	22%	24%	15%
	FAIRHAVEN	L	Dredge	34%	30%	14%	7%	8%	18%
			Trawl	46%	51%	24%	0%	17%	33%
		M	Trawl	0%	0%	0%	2%	11%	7%
		S	Gill	0%	0%	100%	89%	85%	91%
	FAIRHAVEN Average			36%	37%	29%	17%	20%	27%
	GLOUCESTER	L	Gill	3%	1%	12%	19%	9%	9%
			Dredge	48%	52%	10%	3%	6%	24%
			Other	12%	0%	0%	0%	0%	12%
			Trawl	8%	9%	12%	9%	12%	10%
		M	Gill	16%	7%	12%	39%	48%	33%
			Other	1%	2%	4%	0%	0%	3%
			Trawl	4%	4%	8%	8%	6%	6%
		S	Gill	10%	10%	25%	47%	38%	26%
			Other	0%	0%	0%	0%	0%	0%
			Trawl	8%	5%	5%	7%	9%	7%
	GLOUCESTER Average			8%	8%	13%	21%	19%	14%
	NEW BEDFORD	L	Gill	0%	0%	0%	0%	55%	55%
			Dredge	28%	23%	10%	5%	6%	14%
			Other	12%	9%	0%	0%	0%	11%
			Trawl	15%	16%	12%	11%	9%	13%
		M	Dredge	8%	11%	5%	4%	4%	6%
			Trawl	10%	9%	9%	7%	4%	8%
		S	Gill	26%	75%	80%	63%	56%	60%
			Trawl	8%	36%	0%	0%	0%	22%
	NEW BEDFORD Average			21%	20%	11%	8%	8%	14%
	WESTPORT	M	Gill	91%	89%	97%	90%	81%	90%
		S	Gill	43%	43%	56%	63%	57%	53%
	WESTPORT Average			55%	54%	66%	70%	61%	61%

Table 63 Dependency on Monkfish Relative to Vessel Size and Gear Configuration by Primary Port

Average of dependency				YEAR					
HPST	Home Port	VSIZE	Gear	1997	1998	1999	2000	2001	Total
ME	PORT CLYDE	M	Trawl	12%	15%	20%	25%	28%	20%
		S	Trawl	14%	17%	18%	22%	24%	19%
	PORT CLYDE Average			13%	16%	19%	24%	26%	20%
	PORTLAND	L	Trawl	7%	8%	20%	14%	13%	13%
		M	Other	6%	4%	15%	8%	0%	7%
			Trawl	8%	9%	14%	18%	20%	14%
		S	Trawl	4%	7%	8%	9%	14%	8%
	PORTLAND Average			7%	8%	15%	14%	16%	12%
NH	PORTSMOUTH	L	Dredge	0%	0%	2%	0%	0%	2%
			Trawl	0%	1%	0%	11%	13%	8%
		M	Gill	6%	1%	14%	10%	11%	8%
			Trawl	2%	3%	5%	14%	20%	11%
		S	Gill	11%	11%	17%	26%	38%	21%
			Trawl	7%	7%	16%	7%	12%	10%
	PORTSMOUTH Average			9%	7%	14%	20%	29%	16%
NJ	BARNEGAT LIGHT	L	Gill	0%	78%	97%	0%	100%	91%
			Dredge	26%	24%	10%	4%	7%	14%
			Trawl	0%	0%	0%	98%	0%	98%
		M	Gill	61%	70%	95%	56%	84%	75%
			Dredge	29%	24%	9%	4%	4%	14%
		S	Gill	31%	39%	59%	59%	70%	53%
	BARNEGAT LIGHT Average			32%	38%	50%	46%	57%	45%
	POINT PLEASANT	L	Dredge	12%	10%	4%	2%	4%	6%
			Other	0%	0%	1%	2%	0%	1%
			Trawl	0%	1%	0%	0%	3%	1%
		M	Trawl	1%	1%	0%	1%	1%	1%
		S	Gill	44%	86%	92%	91%	82%	79%
	POINT PLEASANT Average			14%	22%	20%	20%	19%	19%
RI	LITTLE COMPTON	M	Gill	13%	0%	1%	22%	21%	14%
		S	Gill	61%	47%	65%	51%	67%	58%
	LITTLE COMPTON Average			45%	47%	44%	42%	51%	46%
	NEWPORT	L	Trawl	8%	12%	17%	10%	12%	12%
		M	Gill	1%	21%	2%	15%	0%	10%
			Other	0%	0%	0%	0%	0%	0%
			Trawl	2%	8%	19%	7%	4%	8%
		S	Gill	52%	61%	79%	50%	59%	60%
	NEWPORT Average			16%	22%	28%	18%	20%	21%
	POINT JUDITH	L	Other	0%	0%	0%	0%	0%	0%
			Trawl	5%	4%	7%	3%	1%	4%
		M	Gill	0%	0%	0%	0%	58%	58%
			Trawl	6%	4%	4%	4%	3%	4%
		S	Gill	0%	30%	16%	37%	40%	31%
	POINT JUDITH Average			6%	5%	5%	5%	5%	5%
	TIVERTON	M	Gill	0%	0%	0%	0%	85%	85%
			Trawl	7%	1%	0%	0%	0%	2%
		S	Gill	36%	63%	63%	61%	64%	59%
	TIVERTON Average			26%	47%	63%	45%	72%	52%
Grand Total				16%	18%	17%	17%	19%	17%

Table 63 Dependency on Monkfish Relative to Vessel Size and Gear Configuration by Primary Port (cont'd.)

The larger producing ports (Boston and New Bedford, MA; Portland, ME; and Point Judith, RI) analyzed in this assessment tend to produce the greatest quantities of monkfish, groundfish, small mesh multispecies, and scallops. These ports are homeport to a greater proportion of larger vessels, while medium and smaller ports are more likely to homeport medium and small vessels. The latter ports (Westport, MA; Tiverton and Little Compton, RI; and Barnegat Light, NJ) are more dependent on monkfish as the primary species landed in pounds and, therefore, tend to be more reactive to changes in fishing activity levels (Table 65).

Pounds Landed		**YEAR**					
VSIZE	Data	**1997**	**1998**	**1999**	**2000**	**2001**	**Ave.**
L	Groundfish	22,738,238	25,103,433	26,356,794	33,068,142	38,603,741	29,174,070
	Sm. Mesh Multi.	25,858,124	18,656,748	17,655,822	30,506,705	60,444,137	30,624,307
	Scallops	5,157,351	5,358,315	10,210,653	14,118,783	18,226,501	10,614,321
	Monkfish	7,527,675	8,134,824	7,726,097	6,520,973	7,319,795	7,445,873
M	Groundfish	9,136,660	10,009,552	9,902,470	11,869,686	13,277,532	10,839,180
	Sm. Mesh Multi.	5,304,164	4,903,750	5,317,571	3,881,026	3,422,956	4,565,893
	Scallops	335,823	401,027	713,706	1,129,176	1,251,518	766,250
	Monkfish	2,082,275	2,272,252	2,605,690	2,859,575	3,581,591	2,680,277
S	Groundfish	5,568,402	4,606,464	4,733,122	5,661,254	5,573,025	5,228,453
	Sm. Mesh Multi.	314,757	275,568	218,319	227,047	283,359	263,810
	Scallops	7,364	9,623	4,340	19,027	101,559	28,383
	Monkfish	3,327,441	4,147,455	5,035,427	4,348,816	6,619,593	4,695,746
Total Groundfish		37,443,300	39,719,449	40,992,386	50,599,082	57,454,298	45,241,703
Total Sm. Mesh Multi.		31,477,045	23,836,066	23,191,712	34,614,778	64,150,452	35,454,011
Total Scallops		5,500,538	5,768,965	10,928,699	15,266,986	19,579,578	11,408,953
Total Monkfish		12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896

Note: only includes ports with average (1999-2002) landings value in excess of $1,000,000 for either homeport or weighout port and select highly dependent ($) ports with average landings value in excess of $800,000. Base measurement is pounds landed by homeport. Vessel size classes (L = > 70 feet, M = 50-70 feet, S = < 50 feet. Data source: logbooks.

Table 64 Primary Species Landed by Vessel Size Class for Primary Ports

Home Port	Data	1997	1998	1999	2000	2001	Ave.	Ground-fish	Sm. Mesh Multi.	Scal-lops	Monk-fish
BOSTON	Groundfish	11,192,224	11,003,031	10,400,741	13,535,834	15,189,096	12,264,185	1	2	4	3
	Sm. Mesh Multi.	15,292,484	5,749,351	4,789,588	7,818,447	4,913,538	7,712,682				
	Scallops	358,243	311,013	846,605	1,099,280	1,401,753	803,379				
	Monkfish	3,120,275	3,844,657	4,221,916	3,407,539	3,748,884	3,668,654				
GLOUCESTER	Groundfish	5,669,676	5,362,758	6,161,431	7,092,394	8,799,926	6,617,237	1	2	4	3
	Sm. Mesh Multi.	1,083,558	1,064,458	1,871,676	1,678,216	1,478,599	1,435,301				
	Scallops	47,948	33,100	69,460	117,817	115,536	76,772				
	Monkfish	685,442	769,365	1,273,418	1,736,545	1,823,630	1,257,680				
PORTLAND	Groundfish	3,720,280	3,891,785	4,264,323	4,699,049	5,734,924	4,462,072	1	2	4	3
	Sm. Mesh Multi.	606,190	229,011	1,655,228	2,428,303	10,645,981	3,112,943				
	Scallops	2,173	205	8	320	325	606				
	Monkfish	441,526	460,030	1,019,863	1,012,746	1,271,608	841,155				
PORTSMOUTH	Groundfish	1,621,183	1,574,345	1,284,264	1,567,659	1,499,708	1,509,432	1	2	4	3
	Sm. Mesh Multi.	199,797	2,707,820	1,897,643	76,668	168,138	1,010,013				
	Scallops	110	931	90,595	115,461	182,208	77,861				
	Monkfish	230,226	202,657	367,036	469,916	751,024	404,172				
NEWPORT	Groundfish	739,217	976,924	814,297	1,201,755	1,269,095	1,000,258	1	2	4	3
	Sm. Mesh Multi.	751,946	501,611	235,975	866,884	778,179	626,919				
	Scallops	48	252	43	283	0	125				
	Monkfish	353,809	478,854	804,735	463,521	616,939	543,572				
CHATHAM	Groundfish	1,619,218	1,189,052	1,561,296	1,807,127	1,472,010	1,529,741	1	3	4	2
	Sm. Mesh Multi.	42,849	5,925	21,513	31,480	18,943	24,142				
	Scallops	200	0	0	7,509	27,211	6,984				
	Monkfish	220,541	285,743	351,809	625,771	681,309	433,035				
PORT CLYDE	Groundfish	758,924	637,377	717,099	903,063	1,226,632	848,619	1	3	4	2
	Sm. Mesh Multi.	0	1,308	365	1,651	1,100	885				
	Scallops	790	1,555	1,835	0	195	875				
	Monkfish	177,741	173,563	245,874	342,768	464,790	280,947				
NEW BEDFORD	Groundfish	9,881,649	10,809,797	12,000,957	14,587,627	18,213,349	13,098,676	1	2	3	4
	Sm. Mesh Multi.	2,058,583	2,931,255	5,469,981	14,068,930	39,410,668	12,787,883				
	Scallops	4,163,998	4,505,347	8,239,359	11,369,373	15,189,880	8,693,591				
	Monkfish	4,376,436	4,329,465	3,015,468	2,670,653	3,574,212	3,593,247				
POINT JUDITH	Groundfish	1,754,635	3,630,303	3,614,603	4,781,383	3,328,616	3,421,908	2	1	4	3
	Sm. Mesh Multi.	10,826,261	9,892,113	6,909,552	7,199,386	6,447,318	8,254,926				
	Scallops	3,285	567	33,803	127,202	193,076	71,587				
	Monkfish	893,737	751,284	765,534	576,671	460,958	689,637				
LITTLE COMPTON	Groundfish	7,519	11,021	11,986	23,769	4,690	11,797	2	3	4	1
	Sm. Mesh Multi.	2,874	2,112	860	4,881	7,006	3,547				
	Scallops	0	0	0	12	59	14				
	Monkfish	218,808	168,084	140,373	132,100	256,832	183,239				
WESTPORT	Groundfish	15,772	10,804	12,287	4,707	40,363	16,787	2	3	4	1
	Sm. Mesh Multi.	1,525	2,265	0	1,900	1,814	1,501				
	Scallops	0	0	0	0	0	0				
	Monkfish	581,765	548,134	536,200	528,532	671,004	573,127				
TIVERTON	Groundfish	70,492	269,573	20,660	57,385	17,041	87,030	3	2	4	1
	Sm. Mesh Multi.	28,237	370,592	720	39,095	11,211	89,971				
	Scallops	40	0	0	0	0	8				
	Monkfish	247,575	199,780	401,312	208,618	520,996	315,656				
BARNEGAT LIGHT	Groundfish	317,820	236,123	40,919	25,758	329	124,190	3	4	2	1
	Sm. Mesh Multi.	68,064	103,240	5,783	31,426	10,816	43,866				
	Scallops	337,460	417,395	702,900	1,110,300	1,174,244	748,460				
	Monkfish	819,892	1,486,927	1,661,085	1,175,117	2,145,032	1,457,611				
FAIRHAVEN	Groundfish	65,939	68,345	26,425	220,232	613,052	198,799	3	4	1	2
	Sm. Mesh Multi.				65		65				
	Scallops	425,552	376,521	739,017	1,023,745	940,838	701,135				
	Monkfish	278,762	325,136	210,425	217,708	400,625	286,531				
POINT PLEASANT	Groundfish	8,752	48,211	61,098	91,340	45,467	50,974	4	1	3	2
	Sm. Mesh Multi.	514,677	275,005	332,828	367,446	257,141	349,419				
	Scallops	160,691	122,079	205,074	295,684	354,253	227,556				
	Monkfish	290,856	530,852	352,166	161,159	133,136	293,634				
Total Groundfish		37,443,300	39,719,449	40,992,386	50,599,082	57,454,298	45,241,703				
Total Sm. Mesh Multi.		31,477,045	23,836,066	23,191,712	34,614,778	64,150,452	35,454,011				
Total Scallops		5,500,538	5,768,965	10,928,699	15,266,986	19,579,578	11,408,953				
Total Monkfish		12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896				

Table 65 Primary Species Landed by Primary Port with Species Ranking

Pounds landed				YEAR					
HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.
MA	BOSTON	L	Groundfish	7,584,033	7,772,732	7,461,275	9,896,891	11,172,650	8,777,516
			Sm. Mesh Multi	15,010,401	5,524,098	4,292,388	7,380,936	4,679,117	7,377,388
			Scallops	344,396	288,730	828,490	1,063,807	1,341,907	773,466
			Monkfish	1,889,374	2,283,190	2,669,004	2,219,475	2,365,472	2,285,303
		M	Groundfish	2,140,860	2,233,473	2,064,386	2,409,573	2,766,349	2,322,928
			Sm. Mesh Multi	270,473	200,052	444,364	386,893	219,465	304,249
			Scallops	11,234	16,119	15,677	29,290	46,965	23,857
			Monkfish	325,502	494,864	633,289	527,635	562,850	508,828
		S	Groundfish	1,467,331	996,826	875,080	1,229,370	1,250,097	1,163,741
			Sm. Mesh Multi	11,610	25,201	52,836	50,618	14,956	31,044
			Scallops	2,613	6,164	2,438	6,183	12,881	6,056
			Monkfish	905,399	1,066,603	919,623	660,429	820,562	874,523
	BOSTON Groundfish			11,192,224	11,003,031	10,400,741	13,535,834	15,189,096	12,264,185
	BOSTON Sm. Mesh Multi.			15,292,484	5,749,351	4,789,588	7,818,447	4,913,538	7,712,682
	BOSTON Scallops			358,243	311,013	846,605	1,099,280	1,401,753	803,379
	BOSTON Monkfish			3,120,275	3,844,657	4,221,916	3,407,539	3,748,884	3,668,654
	CHATHAM	M	Groundfish	299,644	212,474	265,988	208,942	153,076	228,025
			Sm. Mesh Multi	900	0	325	25	2,615	773
			Scallops	0	0	0	0	0	0
			Monkfish	4,003	1,959	3,170	83,835	84,300	35,453
		S	Groundfish	1,319,574	976,578	1,295,308	1,598,185	1,318,934	1,301,716
			Sm. Mesh Multi	41,949	5,925	21,188	31,455	16,328	23,369
			Scallops	200	0	0	7,509	27,211	6,984
			Monkfish	216,538	283,784	348,639	541,936	597,009	397,581
	CHATHAM Groundfish			1,619,218	1,189,052	1,561,296	1,807,127	1,472,010	1,529,741
	CHATHAM Sm. Mesh Multi.			42,849	5,925	21,513	31,480	18,943	24,142
	CHATHAM Scallops			200	0	0	7,509	27,211	6,984
	CHATHAM Monkfish			220,541	285,743	351,809	625,771	681,309	433,035
	FAIRHAVEN	L	Groundfish	65,939	68,345	26,425	108,225	203,353	94,457
			Sm. Mesh Multi.						
			Scallops	425,552	376,521	739,017	1,023,745	940,838	701,135
			Monkfish	278,762	325,136	167,701	92,489	152,675	203,353
		M	Groundfish				96,935	389,610	243,273
			Sm. Mesh Multi.						
			Scallops				0	0	0
			Monkfish				2,810	55,769	29,290
		S	Groundfish			0	15,072	20,089	11,720
			Sm. Mesh Multi.				65		65
			Scallops			0	0	0	0
			Monkfish			42,724	122,409	192,181	119,105
	FAIRHAVEN Groundfish			65,939	68,345	26,425	220,232	613,052	198,799
	FAIRHAVEN Sm. Mesh Multi.						65		65
	FAIRHAVEN Scallops			425,552	376,521	739,017	1,023,745	940,838	701,135
	FAIRHAVEN Monkfish			278,762	325,136	210,425	217,708	400,625	286,531
	GLOUCESTER	L	Groundfish	2,809,746	2,816,290	3,067,749	3,889,628	4,473,117	3,411,306
			Sm. Mesh Multi	50,984	56,192	89,985	53,128	166,294	83,317
			Scallops	44,069	32,332	69,451	117,383	107,037	74,054
			Monkfish	259,158	282,366	457,086	438,743	515,859	390,642
		M	Groundfish	1,783,735	1,391,779	1,876,100	1,991,177	2,825,562	1,973,671
			Sm. Mesh Multi	1,018,168	988,521	1,738,758	1,597,571	1,245,774	1,317,758
			Scallops	18	0	9	0	730	151
			Monkfish	113,813	114,645	204,904	510,142	660,968	320,894
		S	Groundfish	1,076,195	1,154,689	1,217,582	1,211,589	1,501,247	1,232,260
			Sm. Mesh Multi	14,406	19,745	42,933	27,517	66,531	34,226
			Scallops	3,861	768	0	434	7,769	2,566
			Monkfish	312,471	372,354	611,428	787,660	646,803	546,143
	GLOUCESTER Groundfish			5,669,676	5,362,758	6,161,431	7,092,394	8,799,926	6,617,237
	GLOUCESTER Sm. Mesh Multi.			1,083,558	1,064,458	1,871,676	1,678,216	1,478,599	1,435,301
	GLOUCESTER Scallops			47,948	33,100	69,460	117,817	115,536	76,772
	GLOUCESTER Monkfish			685,442	769,365	1,273,418	1,736,545	1,823,630	1,257,680

Table 65 **Primary Species Landed by Primary Port and Vessel Size Class (cont'd.)**

HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.
MA	NEW BEDFORD	L	Groundfish	8,696,655	9,558,041	10,590,509	12,666,840	16,426,395	11,587,688
			Sm. Mesh Multi	2,046,818	2,897,684	5,329,081	14,052,499	39,409,403	12,747,097
			Scallops	4,102,933	4,443,365	8,116,564	11,153,826	14,912,996	8,545,937
			Monkfish	4,019,336	3,968,172	2,745,136	2,384,989	2,917,427	3,207,012
		M	Groundfish	1,169,758	1,251,334	1,410,448	1,918,319	1,784,982	1,506,968
			Sm. Mesh Multi	11,765	33,571	140,900	14,070	1,265	40,314
			Scallops	61,065	61,982	122,795	215,547	276,884	147,655
			Monkfish	259,457	244,407	187,256	164,887	85,559	188,313
		S	Groundfish	15,236	422	0	2,468	1,972	4,020
			Sm. Mesh Multi.				2,361		2,361
			Scallops	0	0	0	0	0	0
			Monkfish	97,643	116,886	83,076	120,777	571,226	197,922
	NEW BEDFORD Groundfish			9,881,649	10,809,797	12,000,957	14,587,627	18,213,349	13,098,676
	NEW BEDFORD Sm. Mesh Multi.			2,058,583	2,931,255	5,469,981	14,068,930	39,410,668	12,787,883
	NEW BEDFORD Scallops			4,163,998	4,505,347	8,239,359	11,369,373	15,189,880	8,693,591
	NEW BEDFORD Monkfish			4,376,436	4,329,465	3,015,468	2,670,653	3,574,212	3,593,247
	WESTPORT	M	Groundfish	0	0	0	3,050	39,623	8,535
			Sm. Mesh Multi.					1,814	1,814
			Scallops	0	0	0	0	0	0
			Monkfish	382,885	417,990	376,320	398,762	291,805	373,552
		S	Groundfish	15,772	10,804	12,287	1,657	740	8,252
			Sm. Mesh Multi	1,525	2,265	0	1,900		1,423
			Scallops	0	0	0	0	0	0
			Monkfish	198,880	130,144	159,880	129,770	379,199	199,575
	WESTPORT Groundfish			15,772	10,804	12,287	4,707	40,363	16,787
	WESTPORT Sm. Mesh Multi.			1,525	2,265	0	1,900	1,814	1,501
	WESTPORT Scallops			0	0	0	0	0	0
	WESTPORT Monkfish			581,765	548,134	536,200	528,532	671,004	573,127
ME	PORT CLYDE	M	Groundfish	541,733	456,621	416,484	520,190	703,262	527,658
			Sm. Mesh Multi	0	1,308	0	1,000		577
			Scallops	425	0	0	0	0	85
			Monkfish	118,041	112,013	164,669	218,820	278,370	178,383
		S	Groundfish	217,191	180,756	300,615	382,873	523,370	320,961
			Sm. Mesh Multi.			365	651	1,100	705
			Scallops	365	1,555	1,835	0	195	790
			Monkfish	59,700	61,550	81,205	123,948	186,420	102,565
	PORT CLYDE Groundfish			758,924	637,377	717,099	903,063	1,226,632	848,619
	PORT CLYDE Sm. Mesh Multi.			0	1,308	365	1,651	1,100	885
	PORT CLYDE Scallops			790	1,555	1,835	0	195	875
	PORT CLYDE Monkfish			177,741	173,563	245,874	342,768	464,790	280,947
	PORTLAND	L	Groundfish	1,722,154	1,917,457	2,403,910	2,477,974	3,272,051	2,358,709
			Sm. Mesh Multi	448,753	61,018	1,634,478	2,382,574	10,558,950	3,017,155
			Scallops	0	0	0	0	0	0
			Monkfish	188,037	218,434	615,761	563,794	624,384	442,082
		M	Groundfish	1,836,129	1,790,196	1,742,549	1,973,451	2,268,849	1,922,235
			Sm. Mesh Multi	26,560	48,314	3,137	45,282	85,441	41,747
			Scallops	2,023	0	8	320	325	535
			Monkfish	227,644	204,981	369,185	408,076	599,521	361,881
		S	Groundfish	161,997	184,132	117,864	247,624	194,024	181,128
			Sm. Mesh Multi	130,877	119,679	17,613	447	1,590	54,041
			Scallops	150	205	0	0	0	71
			Monkfish	25,845	36,615	34,917	40,876	47,703	37,191
	PORTLAND Groundfish			3,720,280	3,891,785	4,264,323	4,699,049	5,734,924	4,462,072
	PORTLAND Sm. Mesh Multi.			606,190	229,011	1,655,228	2,428,303	10,645,981	3,112,943
	PORTLAND Scallops			2,173	205	8	320	325	606
	PORTLAND Monkfish			441,526	460,030	1,019,863	1,012,746	1,271,608	841,155
NH	PORTSMOUTH	L	Groundfish		43,550	63,121	227,875	273,710	152,064
			Sm. Mesh Multi.		2,356,625	1,725,000		14,800	1,365,475
			Scallops		0	90,550	115,436	182,158	97,036
			Monkfish		18,900	29,210	44,400	74,000	41,628
		M	Groundfish	655,704	688,155	364,677	412,384	493,427	522,869
			Sm. Mesh Multi	158,054	348,960	98,909	3,713	485	122,024
			Scallops	0	0	0	0	0	0
			Monkfish	33,426	17,308	74,989	75,155	99,980	60,172
		S	Groundfish	965,479	842,640	856,466	927,400	732,571	864,911
			Sm. Mesh Multi	41,743	2,235	73,734	72,955	152,853	68,704
			Scallops	110	931	45	25	50	232
			Monkfish	196,800	166,449	262,837	350,361	577,044	310,698
	PORTSMOUTH Groundfish			1,621,183	1,574,345	1,284,264	1,567,659	1,499,708	1,509,432
	PORTSMOUTH Sm. Mesh Multi.			199,797	2,707,820	1,897,643	76,668	168,138	1,010,013
	PORTSMOUTH Scallops			110	931	90,595	115,461	182,208	77,861
	PORTSMOUTH Monkfish			230,226	202,657	367,036	469,916	751,024	404,172

Table 65 **Primary Species Landed by Primary Port and Vessel Size Class (cont'd.)**

HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.
NJ	BARNEGAT LIGHT	L	Groundfish	551	234	363	0	0	230
			Sm. Mesh Multi.		1,675	56	40		590
			Scallops	79,287	95,084	128,643	223,804	194,661	144,296
			Monkfish	28,911	349,623	151,929	192,328	127,423	170,043
		M	Groundfish	7,165	6,847	6,056	24,675	6	8,950
			Sm. Mesh Multi	7,830	8,949	1,125	1,896	50	3,970
			Scallops	258,148	322,311	574,235	881,632	926,189	592,503
			Monkfish	244,156	290,661	305,101	163,449	264,431	253,560
		S	Groundfish	310,104	229,042	34,500	1,083	323	115,010
			Sm. Mesh Multi	60,234	92,616	4,602	29,490	10,766	39,542
			Scallops	25	0	22	4,864	53,394	11,661
			Monkfish	546,825	846,643	1,204,055	819,340	1,753,178	1,034,008
	BARNEGAT LIGHT Groundfish			317,820	236,123	40,919	25,758	329	124,190
	BARNEGAT LIGHT Sm. Mesh Multi.			68,064	103,240	5,783	31,426	10,816	43,866
	BARNEGAT LIGHT Scallops			337,460	417,395	702,900	1,110,300	1,174,244	748,460
	BARNEGAT LIGHT Monkfish			819,892	1,486,927	1,661,085	1,175,117	2,145,032	1,457,611
	POINT PLEASANT	L	Groundfish	8,566	32,450	45,743	73,272	35,502	39,107
			Sm. Mesh Multi	314,902	200,822	244,550	266,736	165,551	238,512
			Scallops	160,691	122,079	205,074	295,684	354,193	227,544
			Monkfish	40,483	35,037	21,540	20,605	30,913	29,716
		M	Groundfish	51	15,761	15,355	18,068	9,965	11,840
			Sm. Mesh Multi	192,500	72,386	87,335	99,755	91,540	108,703
			Scallops	0	0	0	0	60	12
			Monkfish	3,860	3,463	2,967	3,488	4,365	3,629
		S	Groundfish	135	0	0	0	0	27
			Sm. Mesh Multi	7,275	1,797	943	955	50	2,204
			Scallops	0	0	0	0	0	0
			Monkfish	246,513	492,352	327,659	137,066	97,858	260,290
	POINT PLEASANT Groundfish			8,752	48,211	61,098	91,340	45,467	50,974
	POINT PLEASANT Sm. Mesh Multi.			514,677	275,005	332,828	367,446	257,141	349,419
	POINT PLEASANT Scallops			160,691	122,079	205,074	295,684	354,253	227,556
	POINT PLEASANT Monkfish			290,856	530,852	352,166	161,159	133,136	293,634

Table 65 **Primary Species Landed by Primary Port and Vessel Size Class (cont'd.)**

HPST	Home Port	VSIZE	Data	1997	1998	1999	2000	2001	Ave.
RI	LITTLE COMPTON	M	Groundfish	175		11,640	22,045	1,595	8,864
			Sm. Mesh Multi	11		5	2,200	140	589
			Scallops	0		0	0	0	0
			Monkfish	20,900		1,370	31,977	15,785	17,508
		S	Groundfish	7,344	11,021	346	1,724	3,095	4,706
			Sm. Mesh Multi	2,863	2,112	855	2,681	6,866	3,075
			Scallops	0	0	0	12	59	14
			Monkfish	197,908	168,084	139,003	100,123	241,047	169,233
	LITTLE COMPTON Groundfish			7,519	11,021	11,986	23,769	4,690	11,797
	LITTLE COMPTON Sm. Mesh Multi.			2,874	2,112	860	4,881	7,006	3,547
	LITTLE COMPTON Scallops			0	0	0	12	59	14
	LITTLE COMPTON Monkfish			218,808	168,084	140,373	132,100	256,832	183,239
	NEWPORT	L	Groundfish	701,773	867,573	668,000	991,248	1,004,810	846,681
			Sm. Mesh Multi	388,926	447,434	218,117	855,912	732,273	528,532
			Scallops	48	137	43	115	0	69
			Monkfish	248,667	293,824	380,820	289,795	372,049	317,031
		M	Groundfish	36,876	108,815	144,170	192,114	254,792	147,353
			Sm. Mesh Multi	362,962	54,104	15,328	7,650	44,862	96,981
			Scallops	0	115	0	168	0	57
			Monkfish	16,672	52,862	49,642	37,678	17,295	34,830
		S	Groundfish	568	536	2,127	18,393	9,493	6,223
			Sm. Mesh Multi	58	73	2,530	3,322	1,044	1,405
			Scallops	0	0	0	0	0	0
			Monkfish	88,470	132,168	374,273	136,048	227,595	191,711
	NEWPORT Groundfish			739,217	976,924	814,297	1,201,755	1,269,095	1,000,258
	NEWPORT Sm. Mesh Multi.			751,946	501,611	235,975	866,884	778,179	626,919
	NEWPORT Scallops			48	252	43	283	0	125
	NEWPORT Monkfish			353,809	478,854	804,735	463,521	616,939	543,572
	POINT JUDITH	L	Groundfish	1,148,821	2,026,761	2,029,699	2,736,189	1,742,153	1,936,725
			Sm. Mesh Multi	7,597,340	7,111,200	4,122,167	5,514,880	4,717,749	5,812,667
			Scallops	375	67	32,821	124,983	192,711	70,191
			Monkfish	574,947	360,142	487,910	274,355	139,593	367,389
		M	Groundfish	605,814	1,602,926	1,584,617	2,044,963	1,585,978	1,484,860
			Sm. Mesh Multi	3,228,921	2,778,605	2,787,385	1,682,991	1,729,269	2,441,434
			Scallops	2,910	500	982	2,219	365	1,395
			Monkfish	318,790	313,585	232,828	232,741	259,781	271,545
		S	Groundfish		616	287	231	485	405
			Sm. Mesh Multi.		2,308		1,515	300	1,374
			Scallops		0	0	0	0	0
			Monkfish		77,557	44,796	69,575	61,584	63,378
	POINT JUDITH Groundfish			1,754,635	3,630,303	3,614,603	4,781,383	3,328,616	3,421,908
	POINT JUDITH Sm. Mesh Multi.			10,826,261	9,892,113	6,909,552	7,199,386	6,447,318	8,254,926
	POINT JUDITH Scallops			3,285	567	33,803	127,202	193,076	71,587
	POINT JUDITH Monkfish			893,737	751,284	765,534	576,671	460,958	689,637
	TIVERTON	M	Groundfish	59,016	251,171		33,800	456	86,111
			Sm. Mesh Multi	26,020	368,980		37,980	236	108,304
			Scallops	0	0		0	0	0
			Monkfish	13,126	3,514		120	300,812	79,393
		S	Groundfish	11,476	18,402	20,660	23,585	16,585	18,142
			Sm. Mesh Multi	2,217	1,612	720	1,115	10,975	3,328
			Scallops	40	0	0	0	0	8
			Monkfish	234,449	196,266	401,312	208,498	220,184	252,142
	TIVERTON Groundfish			70,492	269,573	20,660	57,385	17,041	87,030
	TIVERTON Sm. Mesh Multi.			28,237	370,592	720	39,095	11,211	89,971
	TIVERTON Scallops			40	0	0	0	0	8
	TIVERTON Monkfish			247,575	199,780	401,312	208,618	520,996	315,656
Total Sum of gfish				37,443,300	39,719,449	40,992,386	50,599,082	57,454,298	45,241,703
Total Sum of small				31,477,045	23,836,066	23,191,712	34,614,778	64,150,452	35,454,011
Total Sum of scallop				5,500,538	5,768,965	10,928,699	15,266,986	19,579,578	11,408,953
Total Sum of monklb				12,937,391	14,554,531	15,367,214	13,729,364	17,520,979	14,821,896

Table 65 **Primary Species Landed by Primary Port and Vessel Size Class (cont'd)**

Since this document also serves as the annual Stock Assessment and Fishery Evaluation (SAFE) Report for the 2002 fishing year, regular tables from that document are updated below showing the distribution of permits, landings and revenues on vessels issued a monkfish permit in

FY2002. Data is provided for vessel homeport as indicated on the permit. Table 66 shows the distribution of monkfish permit holders by homeport and monkfish permit category for the six primary, 18 secondary, and "other" monkfish ports for FY2000 – FY2002. Of particular note is the consistency in the numbers of limited access permits homeported in each of the identified ports.

Table 67 and Table 68 show the percentage of monkfish limited access permit holders homeported in primary and secondary ports, respectively, that also hold limited access permits in other fisheries. These tables provide some insight into the range of options available to monkfish vessels when not fishing for monkfish, or if the fishery is reduced to a bycatch-only status. Since the data is broken out by port, it also can be used to determine the relative impact of changes in monkfish regulations on different communities. Ports where a high percentage of vessels have other limited access permits are more likely to be able to offset the impacts of further restrictions in the monkfish fishery than ports where vessels have fewer options, because of the wider range of alternative fisheries. Many of these alternative fisheries, however, are under restrictive management programs that limit the viability of these options.

Table 69 shows the VTR landings for five of the six major ports (as reported by NMFS in their regular "Northeast Preliminary Fisheries Statistics" Report, not including Long Beach/Barnegat Light, NJ) and states, broken down by management area from which landings were reported, as well as by gear type. Virtually all of the monkfish landed in Portland, Gloucester and Boston come from the NFMA, while about 2/3 of New Bedford's landings and only 5 percent of Pt. Judith's landings come from the NFMA. Portland and Boston's landings are almost totally from otter trawls, New Bedford's are about 2/3 trawl, and Pt. Judith and Gloucester landings are even split by gear. New Hampshire, New York and New Jersey landings are predominately caught by gillnet gear.

Port landings and revenue data based on May-April fishing year is presented in Table 70 and Table 71, for primary and secondary ports (as identified in the original FMP), respectively, for FY1995-FY2002. Data is based on the vessel's homeport and, for FY2002, on the vessel's principal port of landing as indicated on the permit application. Note that these figures may differ from the data presented in other tables in this section that may be based on calendar year, dealer weighout, or other perspectives on the landings. While vessels homeported in New Bedford recorded the highest monkfish landings and revenues from 1995-1999, their share declined in more recent years, while the share of vessels homeported in Boston has increased. Of note is the observation that while Boston ranked the highest in landings and revenues based on the vessels' homeport, Portland was the highest based on principal port in FY2002, while Boston and Pt. Judith were the lowest of the six primary ports.

Landings and revenues from monkfish remained essentially unchanged on vessels homeported in Portland, Boston and Gloucester from the previous year, while they declined in New Bedford, Long Beach/Barnegat Light, and Point Judith, perhaps reflecting the lower SFMA trip limit in FY2002. On vessels homeported in the secondary ports in Maine, New Hampshire, and New Jersey saw a decline in monkfish landings and revenues from the previous year, while those from Chatham and Scituate, MA, and NY ports had a noticeable increase.

HOMEPORT		FY 2000 by Category						FY 2001 by Category						FY 2002 by Category					
		A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL	A	B	C	D	E	TOTAL
PRIMARY PORTS		4	16	195	151	348	714	4	16	200	161	366	747	4	17	194	158	402	775
Portland	ME	0	x	10	16	17	44	0	x	11	10	21	43	0	x	10	14	20	45
Boston	MA	x	x	46	47	137	233	x	x	42	49	128	222	x	x	43	43	126	215
Gloucester	MA	0	0	18	34	104	156	0	0	19	35	110	164	0	0	18	33	138	189
New Bedford	MA	x	0	93	30	41	165	0	0	100	34	53	187	0	0	94	35	68	197
Barnegate Light	NJ	x	13	9	11	17	51	x	13	10	17	19	61	x	14	11	17	15	59
Point Judith	RI	x	0	19	13	32	65	x	0	18	16	35	70	x	0	18	16	35	70
SECONDARY PORTS		0	6	55	69	322	452	3	7	57	72	354	493	3	7	59	72	376	517
Rockland	ME	0	x	x	0	5	7	0	x	x	0	8	10	0	x	0	0	4	5
Port Clyde	ME	0	0	3	3	5	11	0	0	5	3	4	12	0	0	5	3	4	12
South Bristol	ME	0	0	x	x	5	9	0	0	x	3	5	10	0	0	x	3	4	9
Ocean City	MD	0	0	0	0	11	11	0	0	0	0	13	13	0	0	0	0	13	13
Chatham	MA	0	0	0	11	47	58	0	0	0	12	46	58	0	0	0	12	68	80
Provincetown	MA	0	0	0	5	11	16	0	0	0	6	11	17	0	0	0	5	13	18
Scituate	MA	0	0	3	7	27	37	0	0	x	7	26	34	0	0	x	7	30	38
Plymouth	MA	0	x	0	x	13	15	0	x	x	x	17	21	0	x	x	x	18	22
Westport	MA	0	0	x	5	13	19	0	0	x	6	17	24	0	0	x	5	16	22
Portsmouth	NH	0	0	4	14	17	35	0	0	3	12	19	34	0	0	3	10	23	36
Point Pleasant	NJ	0	3	x	x	22	28	x	3	x	x	26	33	x	x	x	3	26	33
Cape May	NJ	0	0	19	5	49	73	x	0	16	6	55	79	x	0	18	5	58	83
Greenport	NY	0	0	x	x	4	6	0	0	x	0	5	6	0	0	x	0	6	7
Montauk	NY	0	0	3	5	65	73	0	0	4	6	71	81	0	x	4	7	65	77
Hampton Bay	NY	0	x	x	x	5	8	0	x	x	x	4	7	0	x	x	x	5	8
Newport	RI	0	0	x	5	13	20	0	x	4	5	16	26	0	x	5	7	12	25
Hampton	VA	0	0	4	0	3	7	0	0	4	0	4	8	0	0	5	0	3	8
Newport News	VA	0	0	9	3	7	19	0	0	11	x	7	20	0	0	11	x	8	21
OTHER PORTS		8	10	91	128	1,193	1,430	9	16	78	104	1,261	1,468	8	16	75	105	1,359	1,563
TOTAL		**12**	**32**	**341**	**348**	**1,863**	**2,596**	**16**	**39**	**335**	**337**	**1,981**	**2,708**	**15**	**40**	**328**	**335**	**2,137**	**2,855**

Source: NMFS Statistics Office, permit databases

Table 66 Monkfish permits by port for FY2000-FY2002 by permit category.

Data is not provided for ports with fewer than three but more than zero permits to protect confidentiality.

PRIMARY HOMEPORT		MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENTAGE OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
				BLACK SEA BASS	FLUKE	LOBSTER	MULTISPECIES	OCEAN QUOAHOG	RED CRAB	SCALLOP	SCUP	SQ/MACK/ BUT	TILEFISH
PORTLAND	ME	B	x	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		C	9	22%	33%	67%	100%	0%	0%	0%	33%	33%	0%
		D	14	7%	14%	79%	100%	0%	0%	0%	21%	7%	7%
BOSTON	MA	A	x	100%	0%	100%	0%	0%	0%	0%	100%	0%	0%
		B	x	0%	50%	100%	0%	0%	0%	0%	50%	0%	0%
		C	43	26%	56%	84%	86%	0%	0%	19%	51%	33%	0%
		D	43	21%	53%	86%	98%	0%	0%	5%	37%	26%	0%
GLOUCESTER	MA	C	18	11%	44%	94%	89%	0%	0%	11%	17%	6%	0%
		D	33	3%	36%	94%	100%	0%	0%	0%	18%	3%	0%
NEW BEDFORD	MA	C	94	12%	90%	89%	44%	0%	0%	73%	11%	12%	0%
		D	35	31%	91%	91%	97%	0%	0%	11%	43%	40%	0%
BARNEGATE LIGHT	NJ	A	x	50%	0%	50%	0%	0%	0%	0%	0%	0%	50%
		B	14	64%	0%	7%	0%	0%	0%	0%	21%	0%	21%
		C	11	27%	73%	73%	45%	0%	0%	64%	27%	9%	0%
		D	16	31%	50%	88%	100%	0%	0%	0%	50%	13%	13%
POINT JUDITH	RI	A	x	100%	0%	100%	0%	0%	0%	0%	100%	0%	0%
		C	18	94%	100%	100%	100%	0%	0%	6%	100%	100%	0%
		D	15	73%	93%	100%	100%	0%	0%	0%	93%	87%	0%
TOTAL		A	x	**75%**	**0%**	**75%**	**0%**	**0%**	**0%**	**0%**	**50%**	**0%**	**25%**
		B	17	**53%**	**6%**	**18%**	**0%**	**0%**	**0%**	**0%**	**24%**	**0%**	**18%**
		C	193	**24%**	**76%**	**88%**	**65%**	**0%**	**0%**	**45%**	**31%**	**25%**	**0%**
		D	156	**24%**	**58%**	**90%**	**99%**	**0%**	**0%**	**4%**	**40%**	**27%**	**2%**

Source: NMFS Permit Database

Table 67 Percentage of limited access permits by fishery held by monkfish limited access vessels in monkfish primary ports (as identified in the original FMP) in FY2002.

Data is not provided for ports with fewer than three but more than zero permits to protect confidentiality.

SECONDARY HOMEPORT		MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENTAGE OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:									
				BLACK SEA BASS	FLUKE	LOBSTER	MULTI-SPECIES	OCEAN QUOAHOG	RED CRAB	SCALLOP	SCUP	SQ/MACK/BUT	TILE-FISH
ROCKLAND	ME	B	<3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PORT CLYDE	ME	C	5	0%	0%	80%	100%	0%	0%	0%	20%	0%	0%
		D	3	0%	33%	0%	100%	0%	0%	0%	0%	0%	0%
SOUTH BRISTOL	ME	C	<3	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%
		D	<3	50%	50%	100%	100%	0%	0%	0%	50%	0%	0%
CHATHAM	MA	D	12	33%	42%	100%	100%	0%	0%	0%	50%	0%	0%
PROVINCETOWN	MA	D	5	20%	80%	100%	100%	0%	0%	0%	60%	40%	0%
SCITUATE	MA	C	<3	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%
		D	7	0%	29%	86%	100%	0%	0%	0%	14%	0%	0%
PLYMOUTH	MA	B	<3	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
		C	<3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
		D	<3	0%	100%	50%	100%	0%	0%	0%	0%	0%	0%
WESTPORT	MA	C	<3	100%	100%	100%	100%	0%	0%	0%	100%	0%	0%
		D	5	40%	0%	100%	100%	0%	0%	0%	40%	0%	0%
PORTSMOUTH	NH	C	3	0%	33%	100%	100%	0%	0%	33%	0%	0%	0%
		D	10	10%	40%	80%	100%	0%	0%	0%	10%	0%	0%
POINT PLEASANT	NJ	A	<3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		B	<3	100%	0%	50%	0%	0%	0%	0%	50%	0%	0%
		C	<3	100%	100%	100%	0%	0%	0%	100%	100%	0%	0%
		D	3	100%	67%	100%	100%	0%	0%	0%	100%	67%	0%
CAPE MAY	NJ	A	<3	100%	100%	100%	0%	0%	0%	0%	100%	100%	0%
		C	18	67%	83%	61%	0%	0%	0%	100%	67%	61%	0%
		D	5	100%	100%	100%	80%	0%	0%	20%	100%	100%	0%
GREENPORT	NY	C	<3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
MONTAUK	NY	B	<3	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
		C	3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
		D	7	71%	71%	86%	100%	0%	0%	0%	71%	71%	0%
HAMPTON BAYS	NY	B	<3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		C	<3	100%	100%	0%	100%	0%	0%	0%	100%	0%	0%
		D	<3	100%	100%	100%	100%	0%	0%	0%	100%	100%	0%
NEWPORT	RI	B	<3	100%	0%	100%	0%	0%	0%	0%	0%	0%	0%
		C	5	60%	60%	100%	100%	0%	0%	0%	100%	80%	0%
		D	7	86%	86%	100%	100%	0%	0%	0%	71%	71%	14%
HAMPTON	VA	C	5	40%	80%	0%	0%	0%	0%	100%	40%	40%	0%
NEWPORT NEWS	VA	C	11	64%	100%	36%	18%	0%	0%	100%	64%	45%	0%
		D	<3	100%	100%	100%	100%	0%	0%	100%	100%	0%	0%
TOTAL		A	x	**67%**	**67%**	**67%**	**0%**	**0%**	**0%**	**0%**	**67%**	**67%**	**0%**
		B	7	**43%**	**0%**	**57%**	**0%**	**0%**	**0%**	**0%**	**14%**	**0%**	**0%**
		C	58	**55%**	**72%**	**64%**	**43%**	**0%**	**0%**	**62%**	**60%**	**47%**	**0%**
		D	71	**44%**	**56%**	**89%**	**99%**	**0%**	**0%**	**4%**	**49%**	**28%**	**1%**

Source: NMFS Permit Database

Table 68 Percentage of limited access permits by fishery held by monkfish limited access vessels in monkfish secondary ports (as identified in the original FMP) in FY2002.

Data is not provided for ports with fewer than three but more than zero permits to protect confidentiality.

PORT/ STATE	MAY 02 - APR 03	STOCK AREAS				GEAR TYPES							
		NORTHERN		SOUTHERN		OTTER TRAWL		GILLNET		HOOK		OTHER GEARS	
	1000 Lbs	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent	1000 Lbs	Percent
Portland, ME	10,023	9,990	100%	33	0%	9,452	94%	571	6%	0	0%	0	0%
Gloucester, MA	5,064	4,972	98%	93	2%	2,873	57%	2,188	43%	0	0%	3	0%
Boston, MA	3,422	3,405	99%	17	1%	3,422	100%	0	0%	0	0%	0	0%
New Bedford, MA	9,976	6,499	65%	3,477	35%	6,636	67%	1,903	19%	0	0%	1,438	14%
Point Judith, RI	2,382	130	5%	2,251	95%	1,145	48%	1,153	48%	0	0%	84	4%
MAINE	12,278	12,245	100%	34	0%	11,406	93%	872	7%	0	0%	0	0%
NEW HAMPSHIRE	1,756	1,738	99%	18	1%	237	13%	1,511	86%	0	0%	8	0%
MASSACHUSETTS	21,086	16,762	79%	4,324	21%	13,560	64%	6,045	29%	1	0%	1,480	7%
RHODE ISLAND	4,707	648	14%	4,059	86%	1,755	37%	2,823	60%	0	0%	128	3%
CONNECTICUT	557	23	4%	534	96%	51	9%	327	59%	0	0%	179	32%
NEW YORK	1,193	1	0%	1,192	100%	306	26%	885	74%	1	0%	1	0%
NEW JERSEY	4,663	19	0%	4,644	100%	76	2%	4,215	90%	1	0%	371	8%
OTHER NORTHEAST	1,236	0	0%	1,236	100%	275	22%	814	66%	0	0%	146	12%
TOTAL	**47,476**	**31,436**	**66%**	**16,040**	**34%**	**27,666**	**58%**	**17,493**	**37%**	**3**	**0%**	**2,314**	**5%**

1. *The three digit statistical areas defined below are for statistical and management purposes and may not be consistent with stock area delineation used for biological assessment (see the attached statistical chart).*

   Monkfish stock areas: Northern: 464-465, 467, 511-515, 521-522, 561-562
   Southern: 525-526, 533-534, 537-539, 541-543, 611-639

2. *State landings for CT are estimated for the May 2002 - Apr. 2003 period.*
3. *Landings in live weight.*
4. *Gear data are based on vessel trip reports.*

Table 69 Preliminary FY2002 landings by major port (excluding Long Beach/Barnegat Light, NJ) and state, by management area and gear type.

HOME PORT		MONKFISH LANDINGS AND REVENUES								Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2002
Portland, ME	1,000 Lbs.	1,446	1,605	1,692	1,473	2,543	2,996	1,488	1,498	3,303
	$1,000	$2,258	$2,394	$2,707	$2,640	$5,473	$6,708	$2,005	$2,289	$5,088
Boston, MA	1,000 Lbs.	823	674	918	782	1,268	961	4,964	4,779	1,645
	$1,000	$1,083	$936	$1,300	$1,104	$2,240	$2,028	$6,738	$6,633	$2,084
Gloucester, MA	1,000 Lbs.	1,676	1,154	844	942	1,701	2,365	2,121	2,211	2,750
	$1,000	$1,621	$1,098	$1,038	$1,383	$3,061	$4,442	$3,096	$3,104	$3,917
New Bedford, MA	1,000 Lbs.	5,984	5,790	7,346	8,537	7,027	5,515	3,453	2,326	2,714
	$1,000	$8,981	$8,260	$11,686	$13,926	$14,443	$11,784	$4,698	$3,290	$3,888
Long Beach/Barnegat Light, NJ	1,000 Lbs.	846	1,382	729	1,703	2,569	1,802	3,582	2,451	2,433
	$1,000	$1,211	$1,532	$978	$2,100	$4,431	$3,049	$4,808	$3,248	$3,238
Point Judith, RI	1,000 Lbs.	1,194	2,445	2,126	1,485	1,709	1,635	645	520	1,373
	$1,000	$1,645	$3,367	$3,248	$2,176	$3,275	$3,424	$1,011	$792	$2,006

Source: NMFS Statistics Office, dealer weighout database & permit database

Pounds are in landed weight

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 70 Monkfish landings and revenues for fishing year (May-April) 1995-2002, for permitted vessels homeported in one of the primary monkfish ports in FY 2001 or FY2002.

Revenues are in nominal dollars. FY2002 data is also provided for principal port of landing as indicated on the vessel permit application.

HOME PORT		MONKFISH LANDINGS AND REVENUES								Principal Port
		FY1995	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2002
Rockland, ME	1,000 Lbs.	48	43	37	56	54	74	8	4	38
	$1,000	$61	$55	$54	$90	$113	$184	$15	$6	$53
Port Clyde, ME	1,000 Lbs.	119	120	183	210	294	325	544	471	588
	$1,000	$149	$153	$261	$328	$582	$749	$748	$674	$837
South Bristol, ME	1,000 Lbs.	126	110	90	93	107	219	279	239	227
	$1,000	$163	$145	$131	$147	$217	$494	$410	$344	$321
Ocean City, MD	1,000 Lbs.	179	521	349	282	314	107	3	3	6
	$1,000	$241	$451	$310	$254	$347	$154	$5	$4	$9
Chatham, MA	1,000 Lbs.	126	98	117	232	213	475	613	944	1003
	$1,000	$111	$936	$127	$237	$327	$771	$830	$1,229	$1,308
Provincetown, MA	1,000 Lbs.	83	39	24	86	80	35	26	20	30
	$1,000	$108	$52	$37	$142	$136	$77	$38	$26	$47
Scituate, MA	1,000 Lbs.	59	45	43	330	331	434	100	207	510
	$1,000	$68	$53	$50	$392	$562	$746	$148	$266	$660
Plymouth, MA	1,000 Lbs.	54	33	28	42	14	276	586	613	615
	$1,000	$62	$38	$26	$56	$24	$508	$826	$796	$799
Westport, MA	1,000 Lbs.	810	857	461	539	452	307	686	550	618
	$1,000	$765	$769	$388	$543	$691	$568	$1,023	$739	$829
Portsmouth, NH	1,000 Lbs.	371	388	520	475	845	1254	1099	672	974
	$1,000	$448	$443	$637	$533	$1,320	$2,123	$1,579	$967	$1,364
Point Pleasant, NJ	1,000 Lbs.	84	518	1092	1579	1286	772	338	128	252
	$1,000	$111	$566	$1,097	$1,885	$2,320	$1,208	$442	$164	$325
Cape May, NJ	1,000 Lbs.	273	313	465	316	124	118	187	118	138
	$1,000	$370	$389	$572	$398	$256	$266	$248	$135	$158
Greenport, NY	1,000 Lbs.	26	49	63	42	12	4	7	20	19
	$1,000	$35	$72	$86	$62	$20	$9	$11	$33	$32
Montauk, NY	1,000 Lbs.	47	53	92	157	80	47	148	237	237
	$1,000	$62	$74	$136	$247	$170	$122	$239	$355	$356
Hampton Bays, NY	1,000 Lbs.	87	319	310	454	416	317	94	128	128
	$1,000	$121	$516	$590	$733	$662	$563	$135	$177	$176
Newport, RI	1,000 Lbs.	312	407	436	407	582	361	614	671	648
	$1,000	$388	$505	$558	$584	$1,229	$808	$848	$918	$884
Hampton, VA	1,000 Lbs.	256	336	113	135	42	36	21	4	18
	$1,000	$327	$351	$129	$179	$79	$76	$24	$4	$21
Newport News, VA	1,000 Lbs.	184	254	373	275	96	90	40	47	56
	$1,000	$221	$285	$454	$333	$140	$106	$43	$55	$65

Source: NMFS Statistics Office, dealer weighout database & permit database

Pounds are in landed weight

1995-2001 data based on vessels that were issued a monkfish permit during the 2001 fishing year. 2002 fishing year data are based on vessels issued a monkfish permit during the 2002 fishing year.

Table 71 Monkfish landings and revenues for fishing year (May-April) 1995-2002, for permitted vessels homeported in one of the secondary monkfish ports in FY 2001 or FY2002.

Revenues are in nominal dollars. FY2002 data is also provided for principal port of landing as indicated on the vessel permit application.

5.3.4 Markets and Trade

5.3.4.1 Dockside markets

5.3.4.1.1 Products

Monkfish are currently landed in five product forms - tails, livers, cheeks, belly flaps, and whole fish (gutted with and without liver). Prior to 1982 tails were the only reported product form marketed in the Northeast and whole fish were not reported prior to 1989 (Figure 48). Total landings of tails averaged less than 6 million pounds from 1982 through 1988, but rose to over 17 million pounds in 1993. In 1994 landings fell to 13 million pounds but increased in three consecutive years to 16.8 million pounds only to fall again to about 11 million pounds in 2002.

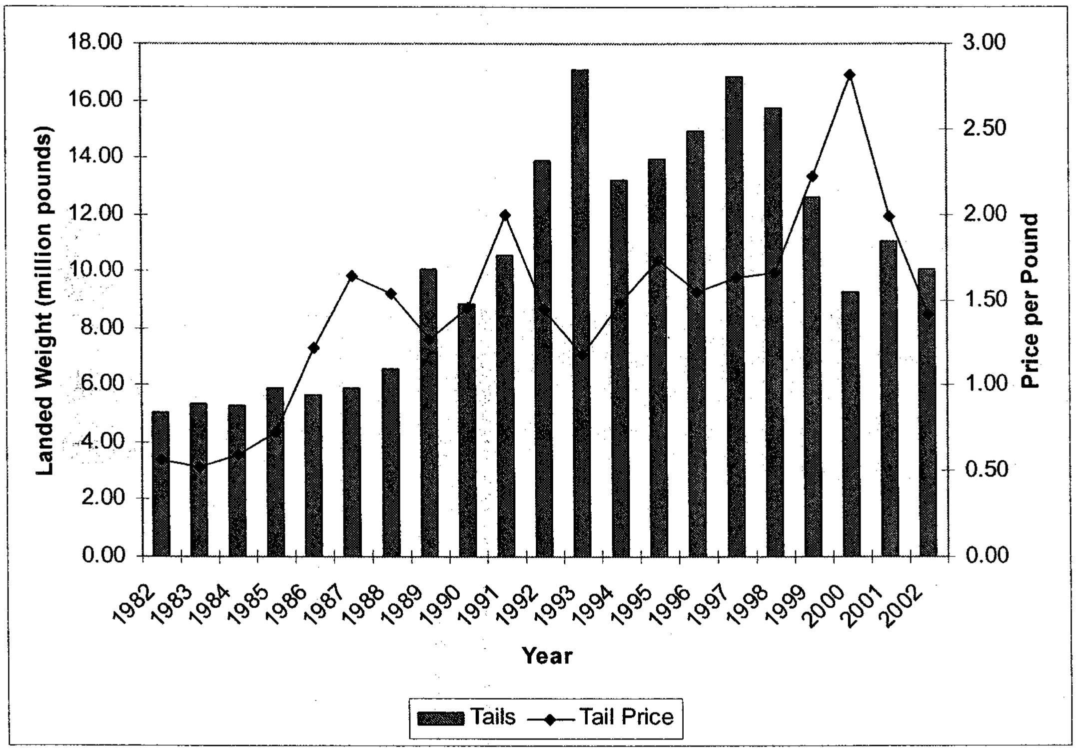


Figure 48 Landed weight and nominal price of monkfish tails 1982-2002

With the exception of 1993 total landings of livers increased in consecutive years from 1982 through 1997 (Figure 49). Since 1997 landings were stable in 1998 and 1999 but fell in 2002 to their lowest level since 1996.

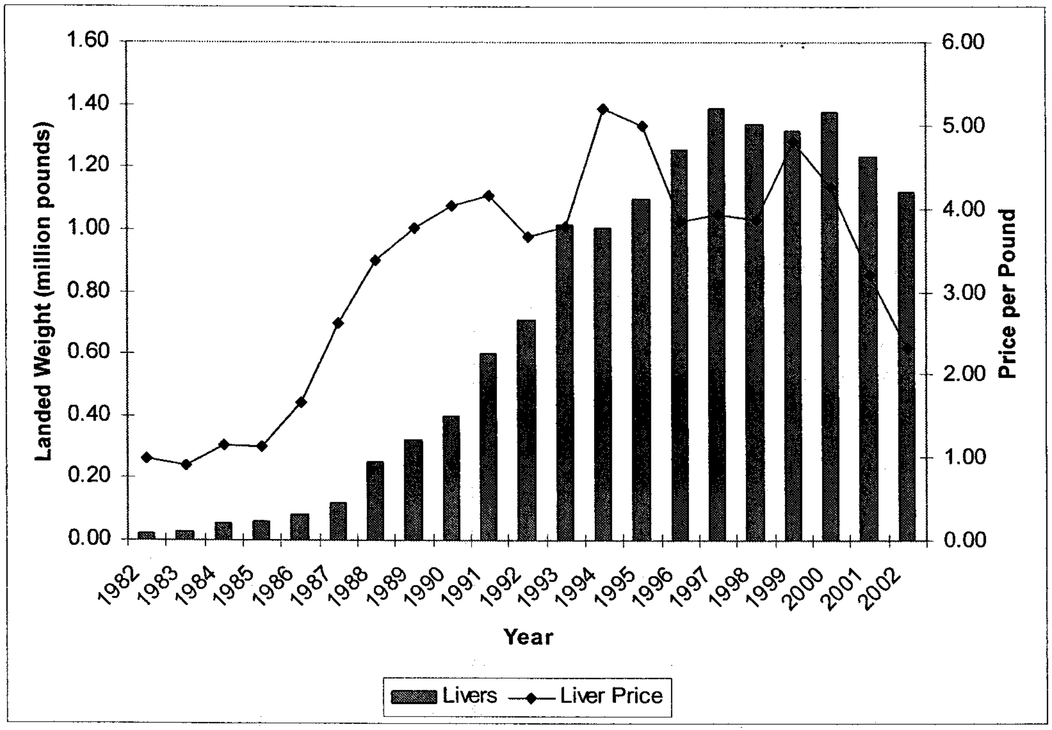


Figure 49 Landed weight and nominal price of monkfish livers, 1982-2002.

Unlike both tail and liver landings, whole monkfish landings increased in 2002 to a time series high of more than 18 million pounds (Figure 50). Whole monkfish landings were less than 2 million pounds annually through 1993 but jumped to between 7 and 12 million pounds from 1994 to 1998. Whole monkfish landings jumped again in 1999 to over 15 million pounds and has remained at that level, or above, ever since.

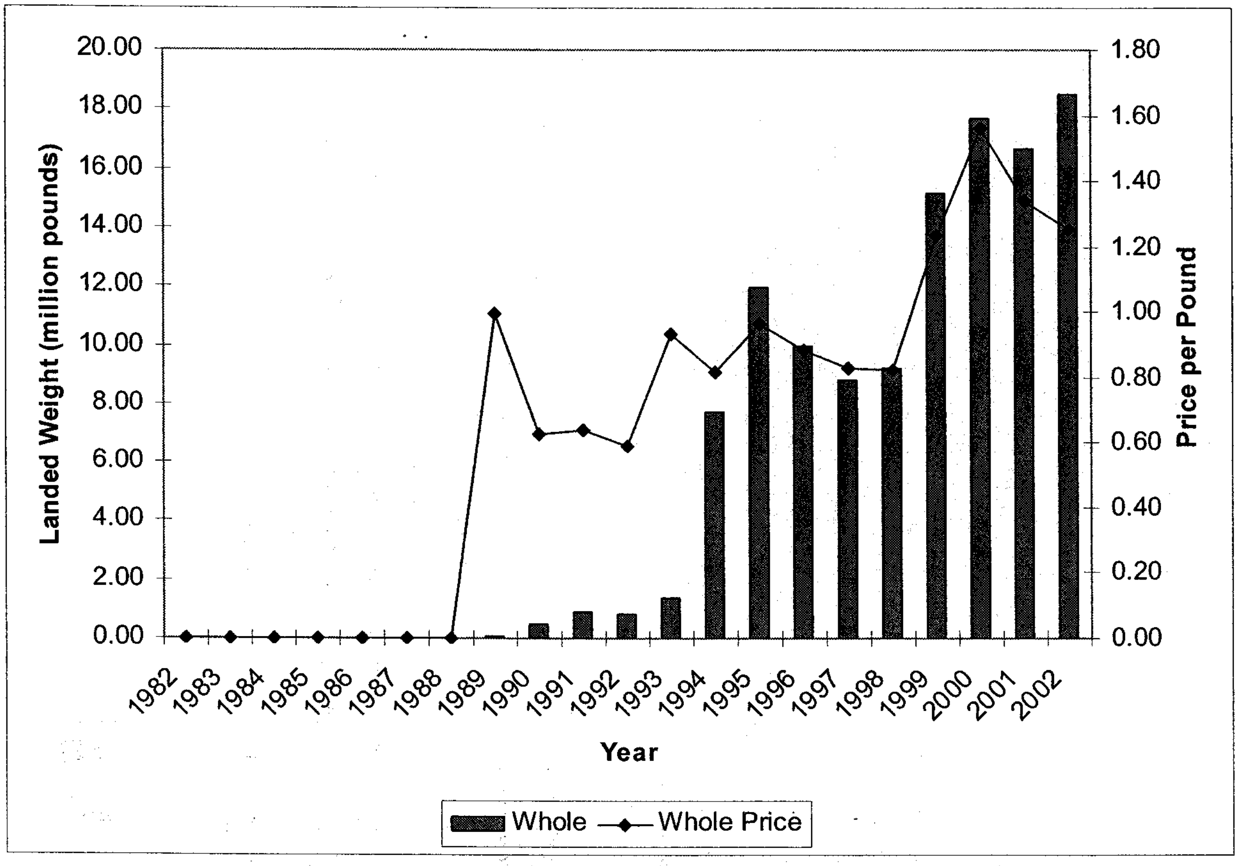


Figure 50 Landed weight and nominal price of whole monkfish, 1982-2002.

Up until 1999 revenues from tails represented at least 50% of total monkfish sales in the Northeast region but has been declining particularly since 1992 with the expansion of markets for whole fish (Figure 51). In fact, sales of whole fish represented more than half of gross revenues over the last three consecutive years. As a proportion of gross revenues the sale of livers has been relatively constant.

Monkfish tails are marketed in three different size classes; large (generally over 2 pounds and 15 inches), small from about ½ to 2 pounds and 12 to 15 inches), and peewee (less than ½ pounds and 12 inches) where the latter was first distinguished as a separate market category in 1991. In cases where market category cannot be identified, gross sales are reported as "unclassified." As a proportion of gross revenue the peewee's market category has never been more than 3% of total sales and has been less than one-tenth of one-percent since implementation of the monkfish FMP due to regulations (minimum size, trip limits and mesh size) that effectively eliminated the supply of peewee product (Figure 52). Given the higher price paid for larger tails, vessels operating under trip limits may select (highgrade) the largest fish to land. Sales of large tails has been at or just slightly above 50% of total tail revenue in every year since 1994 inclusive, while the proportion of sales in the small market category has been increasing over time. Note, however, that the proportion of unclassified monkfish tails has been steadily declining so the change in sales of small tails may be an artifact of a change in reporting rather than an actual change in marketing or landings of small monkfish tails.

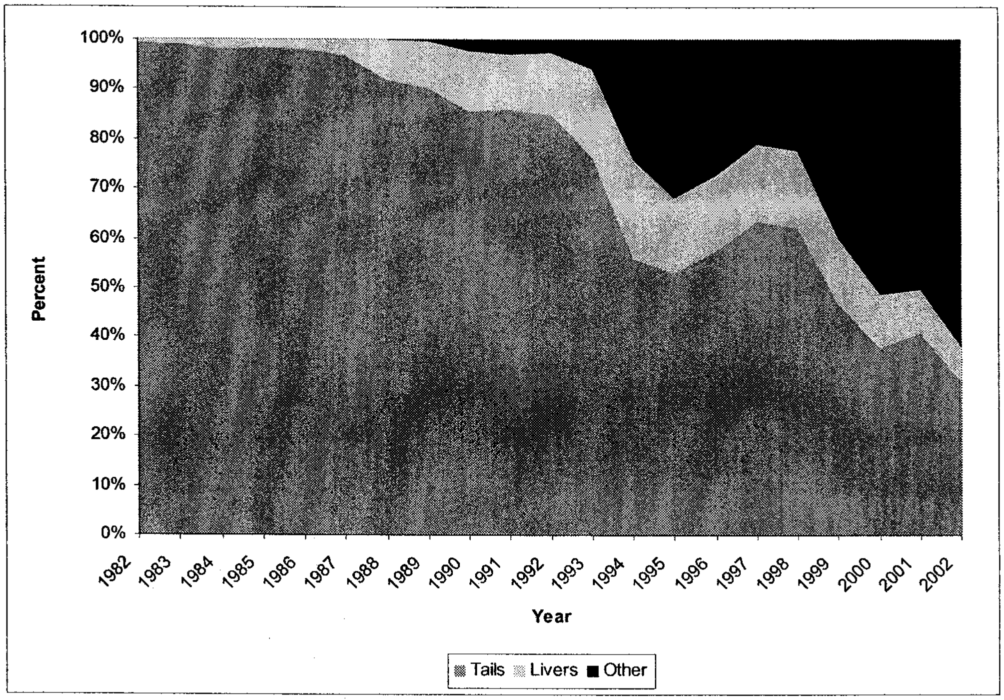


Figure 51 Monkfish landings percentages by product form, 1982-2002.

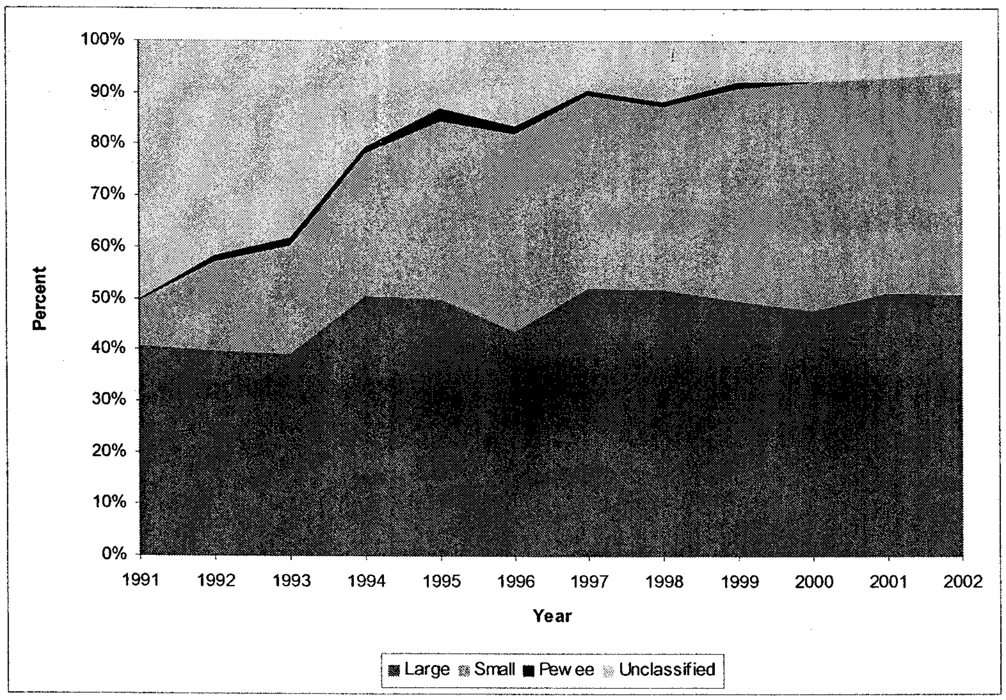


Figure 52 Monkfish landings by market size category, 1982-2002.

5.3.4.1.2 Dockside demand

Dockside prices for monkfish have increased substantially since the days when monkfish was an incidental catch. The nominal price for large tails averaged less than $0.50 per pound from 1982 to 1985, ranged from $1.02 to $1.59 from 1986 to 1990 but averaged more than $1.80 per pound from 1991 to 2002 (Table 72). In real terms (i.e. inflation adjusted using the producer price index for unprocessed finfish, base year = 1982) large tail prices ranged from about $0.80 per pound to $1.15 per pound from 1986 to 2002 with peaks of $1.51 and $1.52 in 1991 and 2000 respectively (Table 73).

Nominal prices for livers reached $5.00 per pound in 1994 and 1995 and averaged more than $4.00 per pound from 1998 to 2000 but have fallen in 2002 to their lowest level since 1986. Real liver prices averaged about $2.50 over the same time period but also fell in 2002 to levels that had not been observed since 1985.

Whole monkfish prices (nominal) averaged about $0.80 per pound from 1989 to 1998 but have since increased by more than $0.40 per pound since 1999, inclusive. However, inflation-adjusted whole monkfish prices for 1999 to 2002 averaged just $0.20 above the longer term average of about $0.50 per pound.

	Tails							
Year	Large	Small	Pewee	Unclassified	Livers	Whole or Round	Cheeks	Belly Flaps
1982	0.49	0.27	0.00	0.57	0.97	0.00	0.00	0.00
1983	0.46	0.24	0.00	0.55	0.90	0.00	0.00	0.00
1984	0.45	0.25	0.00	0.61	1.14	0.00	0.00	0.00
1985	0.60	0.37	0.00	0.74	1.12	0.00	0.00	0.00
1986	1.02	0.59	0.00	1.23	1.65	0.00	0.00	0.00
1987	1.59	0.83	0.00	1.62	2.62	0.00	0.00	0.00
1988	1.30	0.68	0.00	1.49	3.37	0.00	0.00	0.00
1989	1.55	0.65	0.00	1.18	3.77	0.99	0.00	0.00
1990	1.55	0.74	0.00	1.35	4.02	0.63	0.00	0.00
1991	2.06	1.24	0.51	1.90	4.16	0.64	1.83	0.00
1992	1.67	1.07	0.47	1.20	3.66	0.59	1.26	1.00
1993	1.52	0.86	0.40	0.82	3.80	0.93	0.73	0.00
1994	1.50	0.88	0.39	1.09	5.20	0.82	0.78	0.70
1995	1.70	1.25	0.60	1.26	4.99	0.96	0.70	1.10
1996	1.76	1.07	0.56	1.27	3.85	0.88	1.13	0.78
1997	1.72	1.15	0.74	1.41	3.93	0.83	0.87	1.07
1998	1.64	1.29	0.88	1.30	3.87	0.82	0.73	1.67
1999	2.07	1.87	0.84	1.48	4.80	1.24	0.99	1.43
2000	2.77	2.41	1.71	2.44	4.26	1.56	0.33	1.00
2001	2.12	1.59	0.89	1.69	3.20	1.34	0.42	1.40
2002	1.59	1.07	1.12	1.29	2.32	1.26	0.68	1.50

Table 72 Monkfish nominal price per pound by market category, 1982-2002

Year	Large	Small	Pewee	Unclassified	Livers	Whole or Round	Cheeks	Belly Flaps
1982	0.49	0.27	0.00	0.57	0.97	0.00	0.00	0.00
1983	0.48	0.25	0.00	0.58	0.94	0.00	0.00	0.00
1984	0.39	0.22	0.00	0.54	1.00	0.00	0.00	0.00
1985	0.49	0.31	0.00	0.61	0.92	0.00	0.00	0.00
1986	0.91	0.53	0.00	1.10	1.47	0.00	0.00	0.00
1987	1.10	0.57	0.00	1.12	1.80	0.00	0.00	0.00
1988	0.75	0.40	0.00	0.86	1.95	0.00	0.00	0.00
1989	1.15	0.48	0.00	0.87	2.79	0.73	0.00	0.00
1990	1.09	0.52	0.00	0.95	2.83	0.44	0.00	0.00
1991	1.51	0.91	0.37	1.40	3.05	0.47	1.34	0.00
1992	1.07	0.69	0.30	0.77	2.35	0.38	0.81	0.64
1993	0.89	0.51	0.23	0.48	2.24	0.55	0.43	0.00
1994	0.86	0.50	0.22	0.62	2.97	0.47	0.45	0.40
1995	0.99	0.72	0.35	0.73	2.89	0.56	0.41	0.64
1996	0.95	0.58	0.30	0.68	2.08	0.48	0.61	0.42
1997	1.04	0.69	0.44	0.85	2.37	0.50	0.52	0.64
1998	0.96	0.75	0.51	0.76	2.27	0.48	0.43	0.98
1999	1.08	0.97	0.44	0.77	2.51	0.64	0.52	0.75
2000	1.52	1.32	0.94	1.34	2.34	0.86	0.18	0.55
2001	1.20	0.90	0.51	0.96	1.81	0.76	0.24	0.79
2002	0.79	0.53	0.56	0.64	1.15	0.62	0.34	0.74

Table 73 Real monkfish price per pound by market category, 1982-2002,
(PPI for Unprocessed Finfish Base Year = 1982)

Dockside prices vary on a seasonal basis particularly for livers as the quality and value of the product varies over the year with the spawning cycle and international demand. Specifically, liver landings and prices peak during the late fall and winter months (October through February) (Figure 53). Note that implementation of the monkfish FMP in November, 1999 has had no apparent affect on the seasonal pattern of liver markets although prices did spike to over $9.00 per pound in December, 1999. Although liver prices follow a distinct seasonal pattern there is no apparent relationship between prices (inflation-adjusted) and quantities supplied (Figure 54).

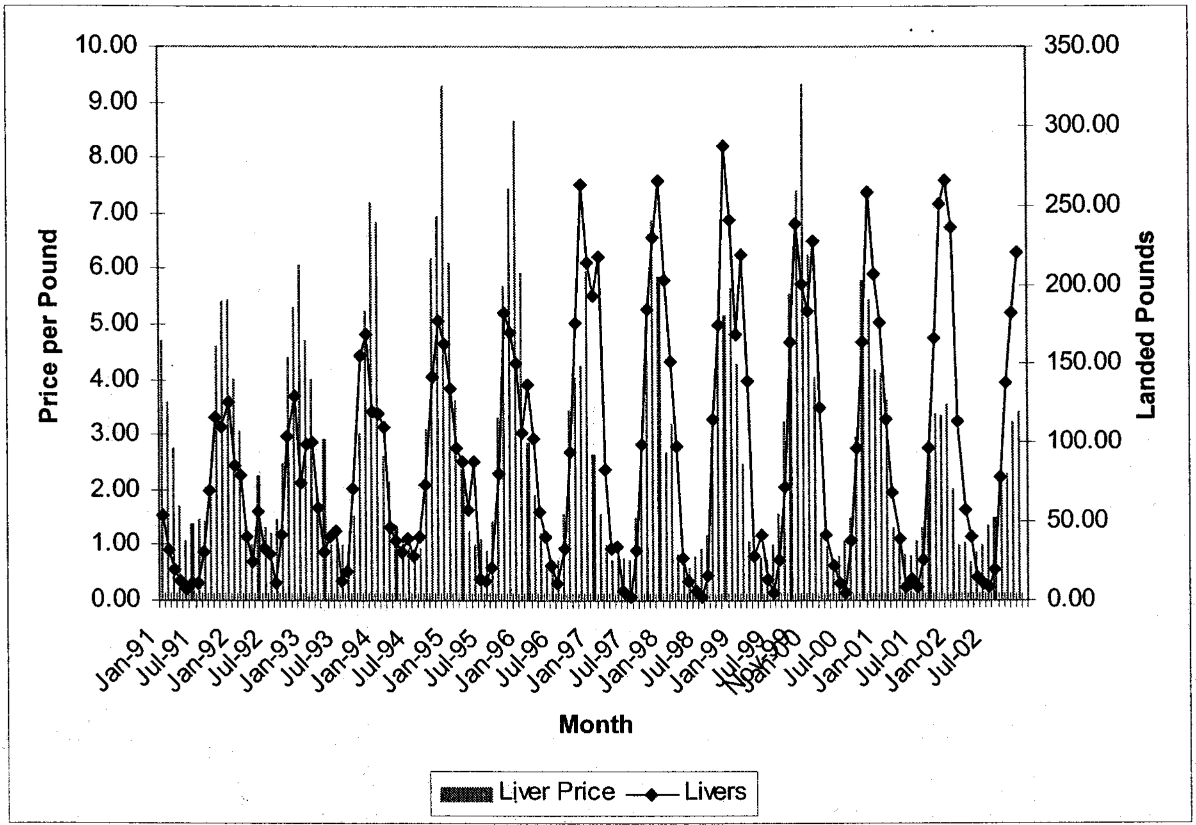


Figure 53 Seasonal pattern of liver landings and price, 1991 –2002.

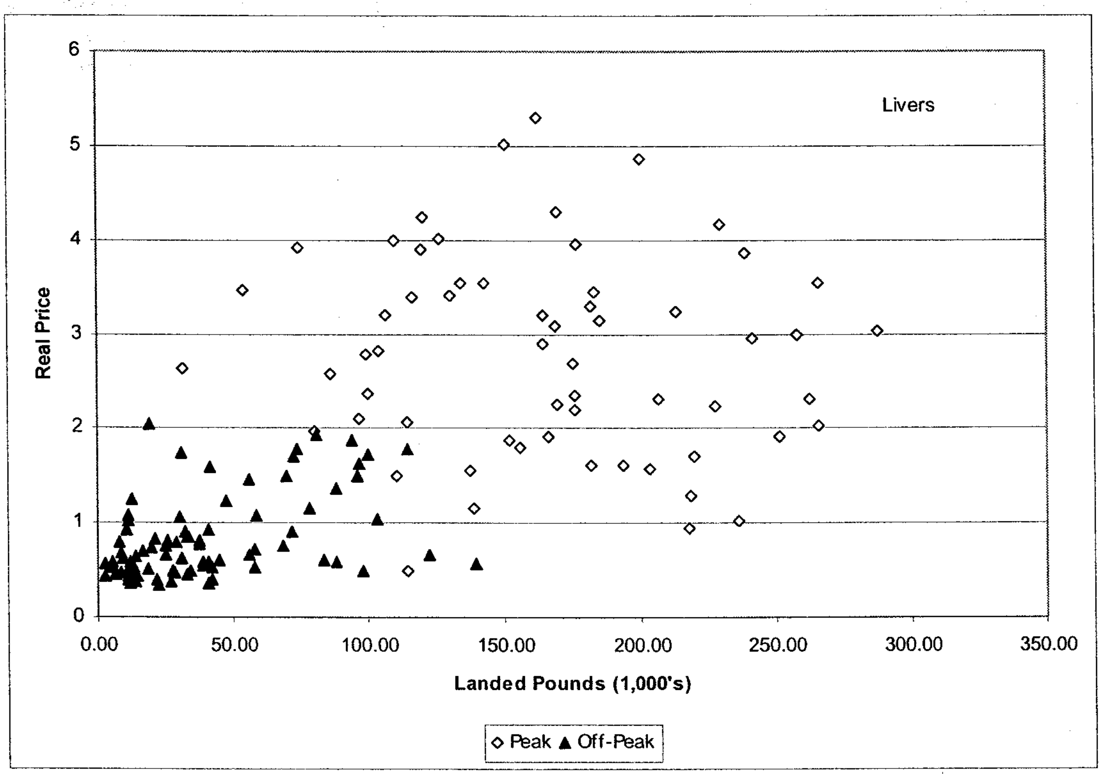


Figure 54 Liver price seasonality, and lack of price-to-quantity-landed relationship.

Prior to FMP implementation, landings of tails followed a bimodal seasonal cycle with landings peaking in June and picking up again October through January (Figure 55). The latter time period closely corresponds with the peak season for monkfish livers. Since plan implementation, this seasonal pattern has been disrupted and landings of tails have not yet returned the bimodal pattern exhibited in the past. Dockside prices for monkfish tails also exhibit no discernible inverse relationship between landed quantities and dockside prices adjusted for inflation, although there does appear to a modest upward shift in the post-FMP price-quantity relationship (Figure 56).

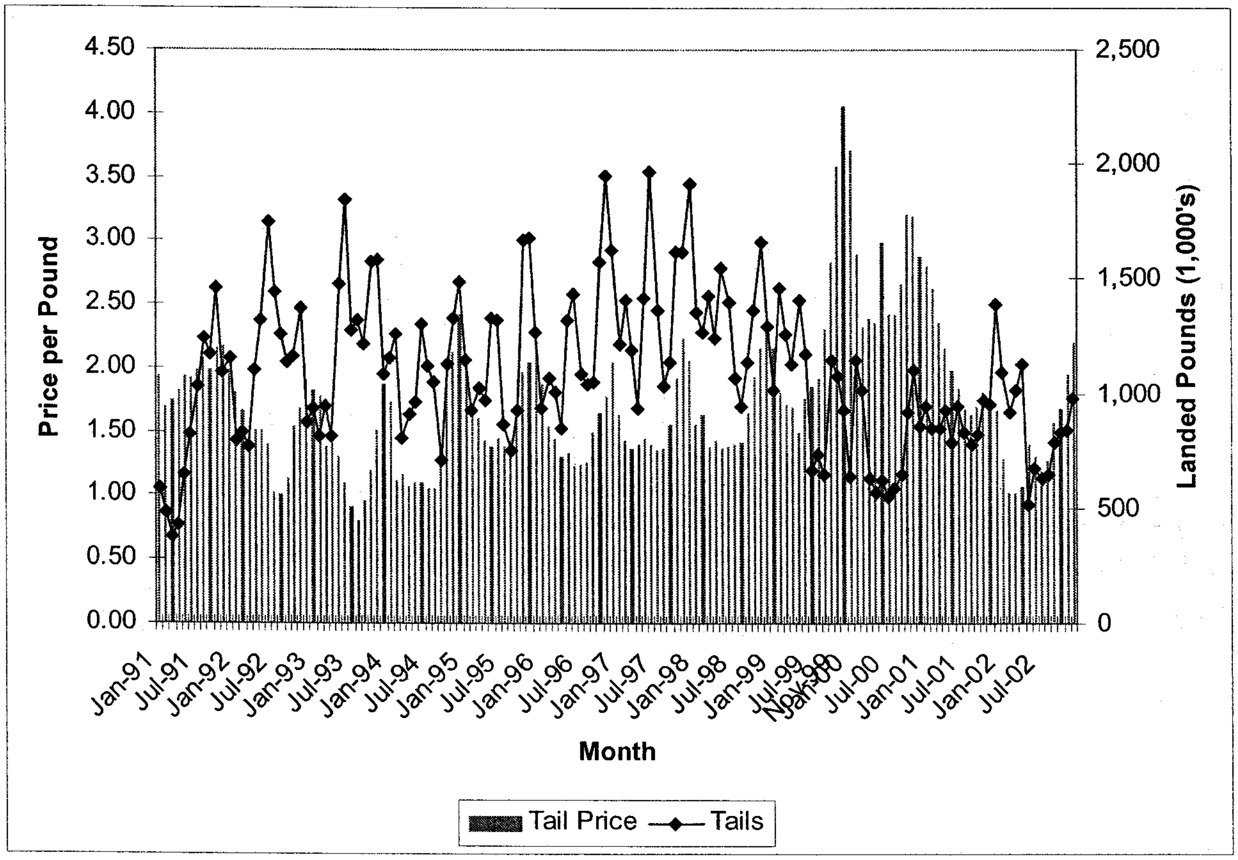


Figure 55 Seasonal pattern of monkfish tail landings and price, 1991 –2002

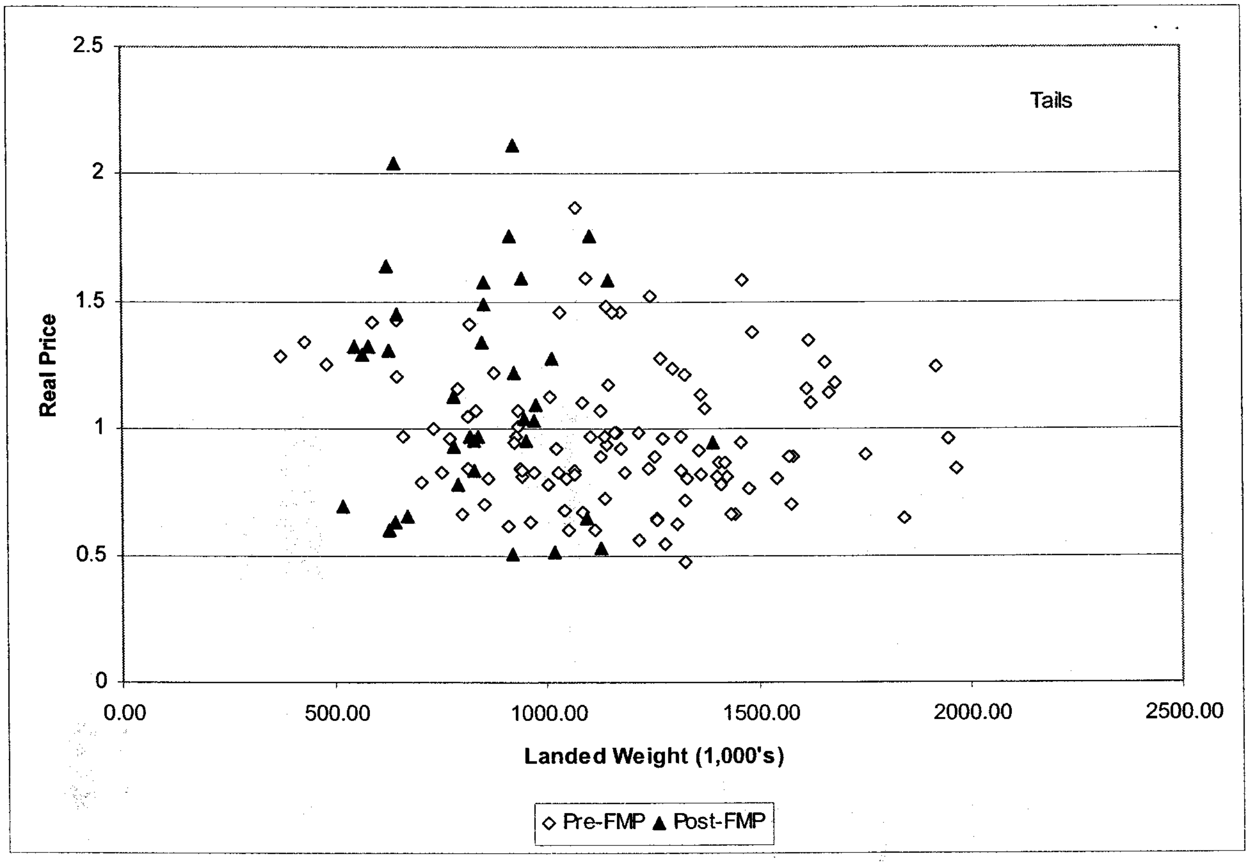


Figure 56 Lack of price-to-quantity landed relationship for monkfish tails.

The seasonal landings pattern for whole fish is similar to that of monkfish tails but the peaks and valleys are more distinct. Specifically, landings tend to increase steadily from February to a peak in May and June followed by a sharp drop-off through September (Figure 57). Whole monkfish landings increase after September through the rest of the year peaking in November, December and January. Dockside prices for whole monkfish follow no discernible seasonal pattern nor do they indicate any strong inverse relationship between landed quantities and inflation-adjusted prices (Figure 58). However, as noted for tails, there does appear to have been a general increase in prices since FMP implementation.

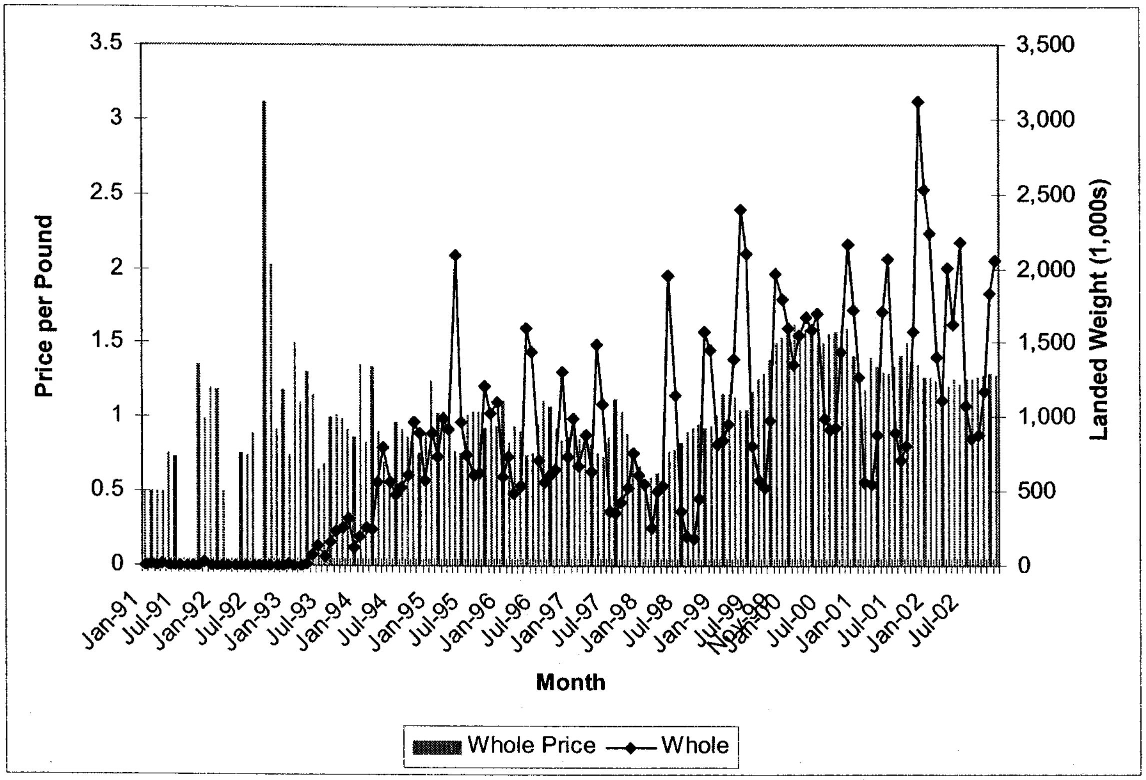


Figure 57 Seasonal pattern of whole monkfish landings and price, 1991 –2002

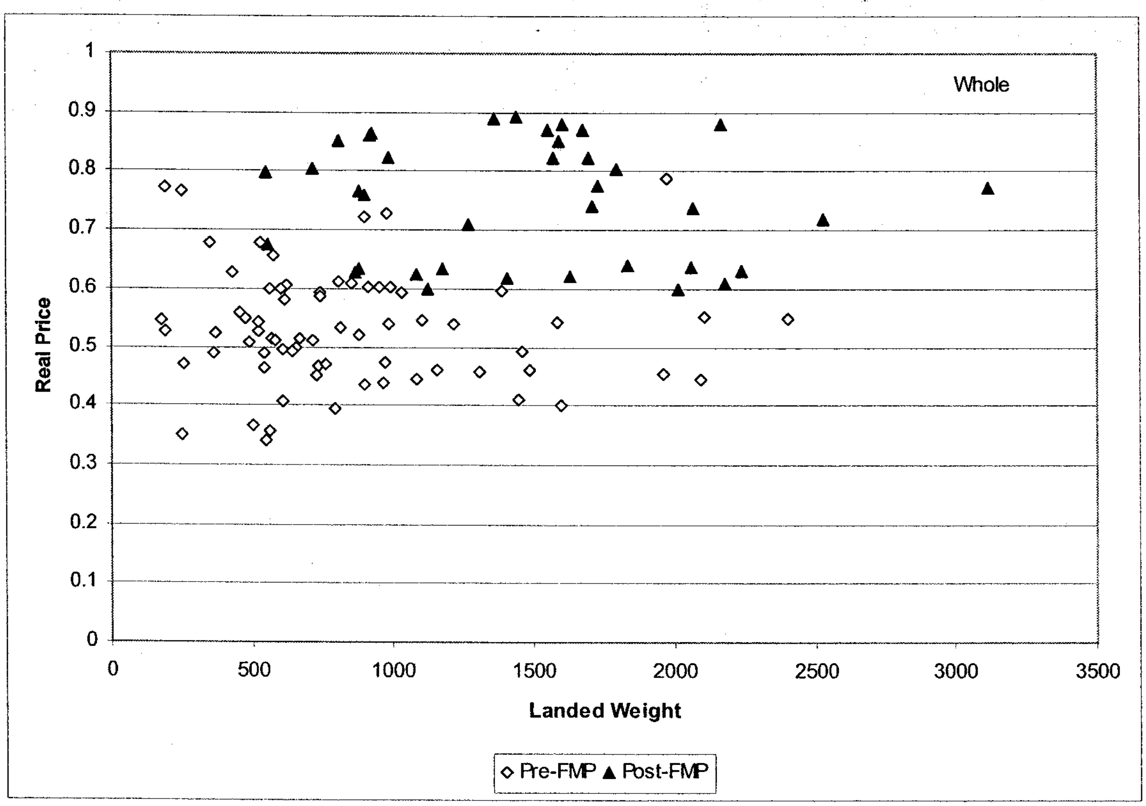


Figure 58 Lack of price-to-quantity landed relationship for whole monkfish.

5.3.4.2 Trade

Unlike many seafood products harvested by Northeast region commercial fishermen that are destined for domestic markets, most monkfish are exported. This means that U.S. monkfish markets compete with larger supplies in global markets where prices are determined primarily by factors that affect international demand in Europe and Asia. According to FAO statistics the global supply of monkfish rose from 67,000 MT in 1982 to 108,000 MT in 1996 with the majority coming from the Northeastern and Northwestern Atlantic (Figure 59). Among Northeast and Northwest Atlantic producers, the U.S. has been the world's largest producer of monkfish since 1992 followed by the United Kingdom and France (Figure 60).

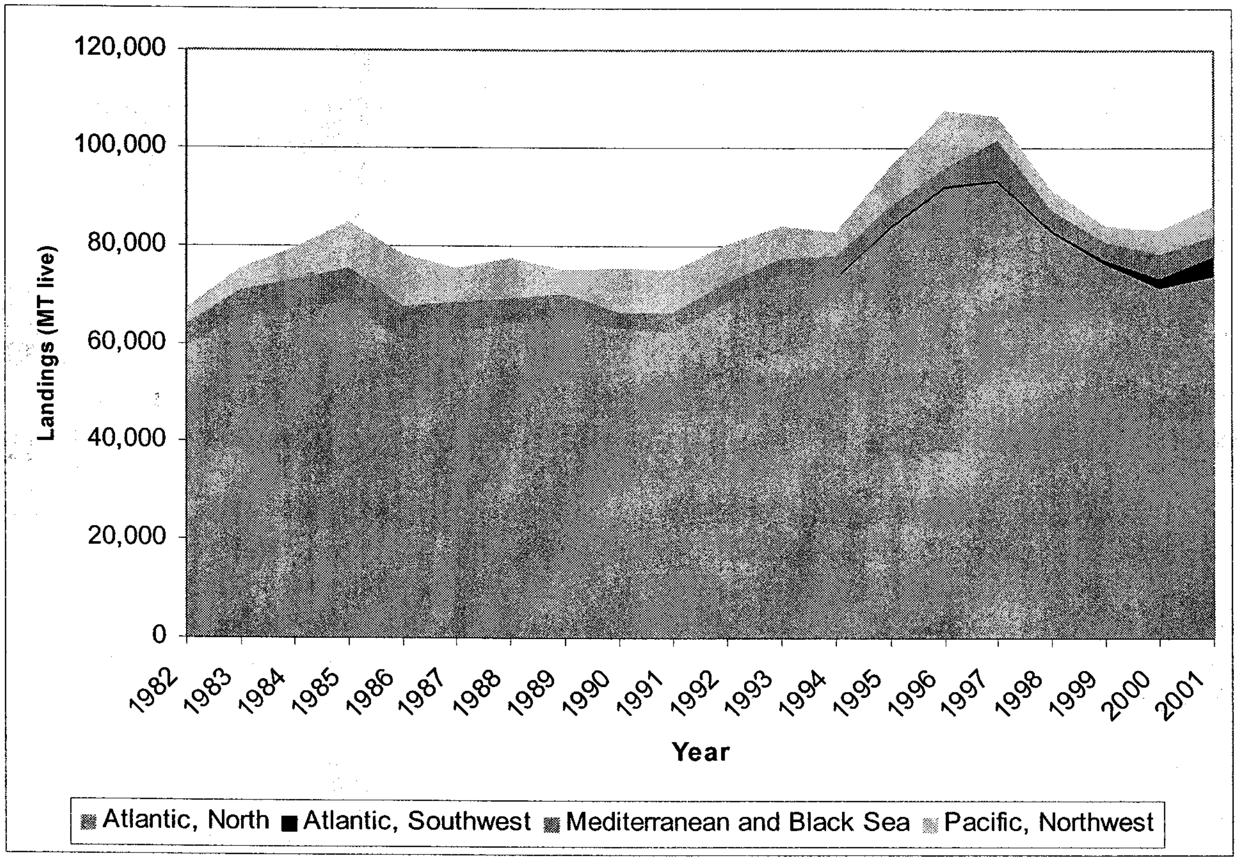


Figure 59 Regional sources of global market supply of monkfish (FAO)

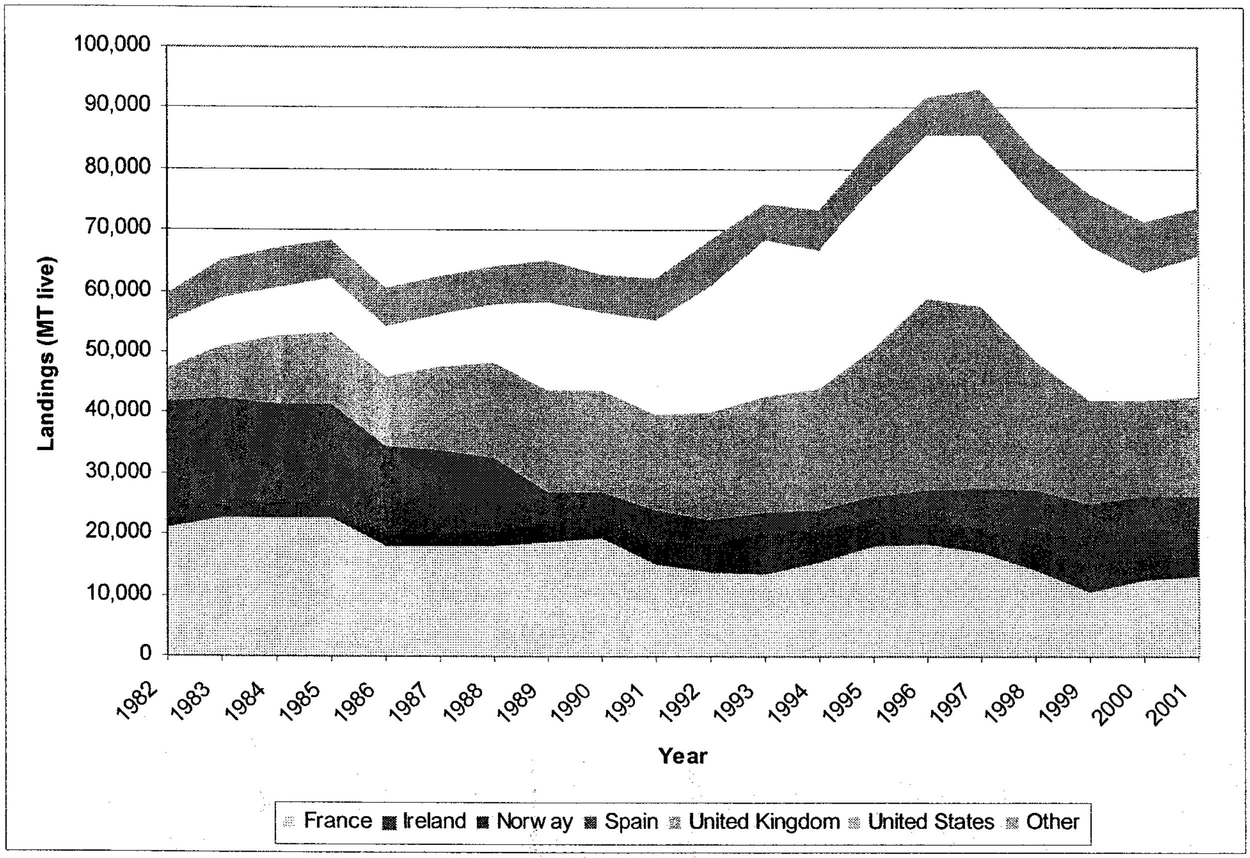


Figure 60 Northeast and Northwest Atlantic monkfish production by country, 1982-2002.

The United States exports monkfish products primarily to Europe and Asia as whole fish, tails, and filets. In addition, the livers are sold, primarily into Asian markets. Existing trade data is only available on a detailed species basis since 1995. These data may also omit trade volume for seafood that is not identified and include only fresh or frozen fish. This means that livers may not be included which would understate the value of trade particularly with Asian countries as most monkfish shipped to Europe is in the form of tails.

Whole fish are almost exclusively exported to South Korea and other Asian markets. Small tails, either whole or processed into filets, are shipped fresh or frozen, primarily to European markets. Large tails are sold domestically or exported to Europe (fresh or frozen, sometimes processed into filets), depending on the season. In general, the exporters of monkfish deal exclusively with one or the other region (Europe or Asia).

In 1995 the value of monkfish exports was over $14 million, of which, the majority ($12 million) was shipped to Europe (Figure 61). Export value increased to $22 million in 1996 but fell in both 1997 and 1998. Since 1999, however, the value of U.S. exports of monkfish has risen steadily and was approximately $41 million in 2002.

Since 1998 the quantity of monkfish going to Asian markets has increased while European exports have fallen to less than 20% of total value. Monkfish exports to Asia go almost exclusively to Japan and South Korea with the latter accounting for nearly 90% of total export value in each of the past three years (Figure 62). European exports go mainly to France (50 to 60% of export value) with lesser quantities going to Portugal, Germany, the United Kingdom, the Netherlands, and Belgium (Figure 63).

The following tables (Table 74 and Table 75) show weights (in kilos) and value (nominal dollars) of monkfish exports by country and product form (fresh or frozen) for fishing years 1999 – 2002, as compiled by the U.S. Census Bureau and reported by NMFS Office of Science and Technology. **NOTE:** Since the reported weights are the actual weight of product being exported, and since product form (in terms of whole fish, tails, filets, livers) is not identified, the figures are not comparable to the landings figures reported in other sections of the document.

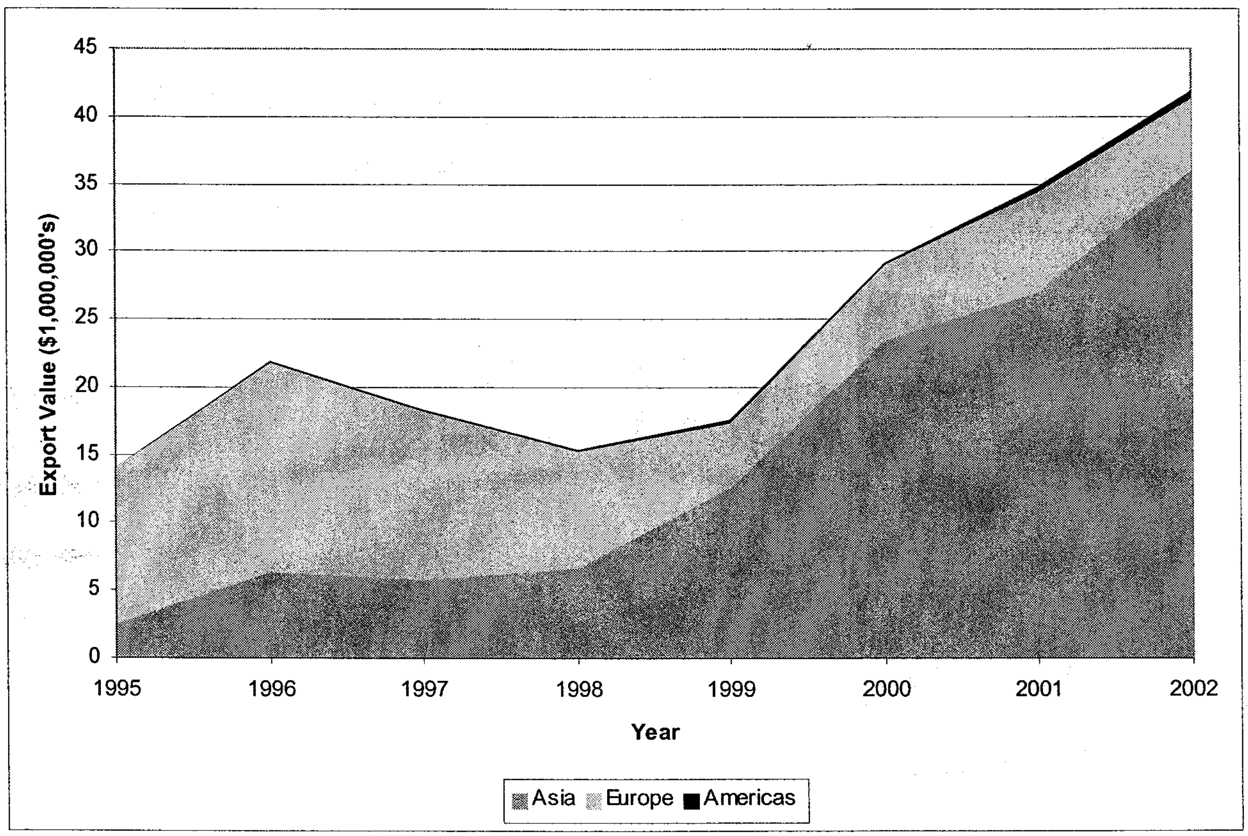


Figure 61 Monkfish exports by region, 1995-2002.

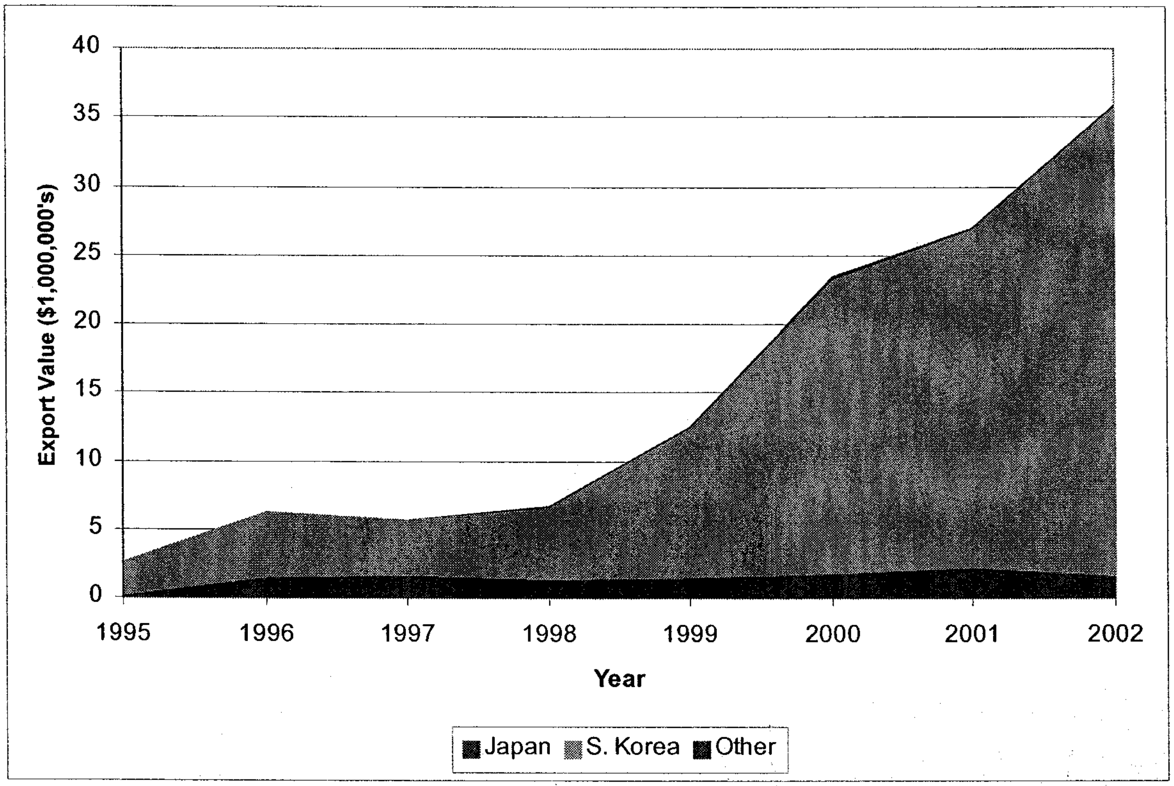


Figure 62 Monkfish exports to Asia, by country, 1995-2002

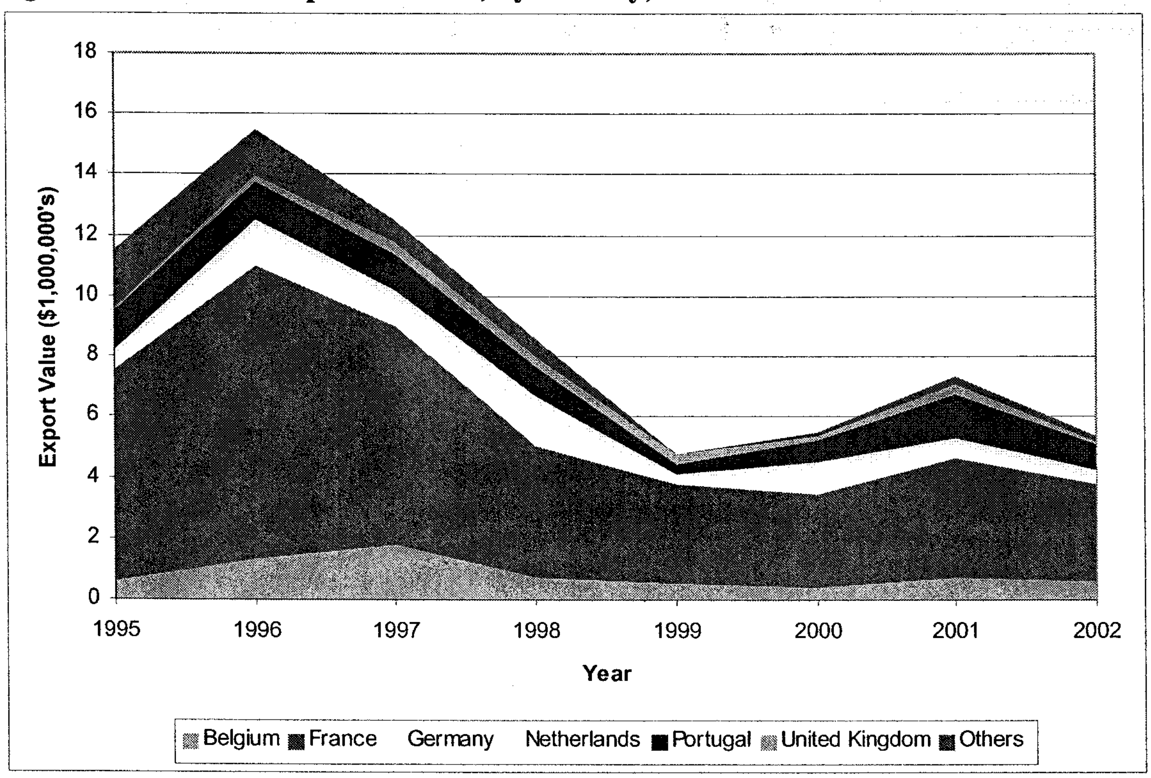


Figure 63 Monkfish exports to Europe, by country, 1995-2002

FY1999

Sum of KILOS	**PRODUCT**		
COUNTRY	**MONKFISH FRESH**	**MONKFISH FROZEN**	**Grand Total**
BELGIUM	37,386	81,772	119,158
CANADA	28,543		28,543
CHINA	1,807		1,807
CHINA - HONG KONG	5,174		5,174
CHINA - TAIPEI	2,569	26,815	29,384
FINLAND	642		642
FRANCE	99,586	530,054	629,640
GERMANY		145,409	145,409
GREECE	1,926		1,926
ITALY	1,400		1,400
JAPAN	281,184		281,184
MALAYSIA	7,095		7,095
MEXICO	6,963	2,497	9,460
PHILIPPINES	2,180		2,180
PORTUGAL		119,312	119,312
SINGAPORE	629	21,109	21,738
SOUTH KOREA	1,278,947	2,761,085	4,040,032
SWEDEN	644		644
UNITED KINGDOM		30,483	30,483
Grand Total	1,756,675	3,718,536	5,475,211

FY2000

Sum of KILOS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM		86,502	86,502
CANADA	48,852	827	49,679
CHINA - HONG KONG	386		386
CHINA - TAIPEI	728		728
COSTA RICA	1,401		1,401
FRANCE	99,305	632,597	731,902
GERMANY	12,995	107,373	120,368
ITALY		103,788	103,788
JAPAN	247,520	6,914	254,434
NETHERLANDS	40,235		40,235
PANAMA	7,128		7,128
PHILIPPINES		35,899	35,899
PORTUGAL	13,610	218,007	231,617
SINGAPORE		37,210	37,210
SOUTH KOREA	1,836,666	2,924,933	4,761,599
SPAIN		10,108	10,108
SWEDEN	1,111		1,111
UNITED KINGDOM		128,853	128,853
VENEZUELA	5,721		5,721
Grand Total	2,315,658	4,293,011	6,608,669

Table 74 Weight (kilos) of monkfish exports by Country and Product form (fresh/frozen)

FY2001

Sum of KILOS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	28,964	83,051	112,015
CANADA	118,563		118,563
CHINA		3,181	3,181
CHINA - HONG KONG	1,036		1,036
FRANCE	294,145	505,670	799,815
GERMANY		131,083	131,083
INDONESIA		12,524	12,524
ITALY	4,203		4,203
JAPAN	240,380	176,444	416,824
MALTA	21,828	12,000	33,828
NETHERLANDS	3,430	20,000	23,430
PORTUGAL	22,004	213,770	235,774
SOUTH KOREA	1,802,825	5,853,082	7,655,907
UNITED KINGDOM	12,636	32,023	44,659
Grand Total	2,550,014	7,042,828	9,592,842

FY2002

Sum of KILOS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	1,983	75,432	77,415
CANADA	105,054		105,054
CAYMAN IS.	2,631		2,631
CHINA		102,840	102,840
CHINA - TAIPEI	147		147
FALKLAND IS.	840		840
FRANCE	565,462	345,788	911,250
GERMANY		64,818	64,818
ITALY	11,937	27,900	39,837
JAPAN	146,592	210,695	357,287
KENYA	1,357		1,357
NETHERLANDS	105,250		105,250
PORTUGAL	150,034	114,280	264,314
SOUTH KOREA	1,201,680	6,783,493	7,985,173
SPAIN	1,170		1,170
UNITED KINGDOM	516	11,110	11,626
Grand Total	2,294,653	7,736,356	10,031,009

Table 74 Weight (kilos) of monkfish exports by Country and Product form (fresh/frozen)

FY1999

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	$266,015	$429,556	$695,571
CANADA	$155,439		$155,439
CHINA	$8,870		$8,870
CHINA - HONG KONG	$32,396		$32,396
CHINA - TAIPEI	$10,271	$56,750	$67,021
FINLAND	$2,930		$2,930
FRANCE	$758,134	$1,997,199	$2,755,333
GERMANY		$519,142	$519,142
GREECE	$10,615		$10,615
ITALY	$13,700		$13,700
JAPAN	$1,759,835		$1,759,835
MALAYSIA	$48,531		$48,531
MEXICO	$22,303	$21,686	$43,989
PHILIPPINES	$19,400		$19,400
PORTUGAL		$357,231	$357,231
SINGAPORE	$3,326	$71,400	$74,726
SOUTH KOREA	$5,481,306	$9,974,549	$15,455,855
SWEDEN	$3,548		$3,548
UNITED KINGDOM		$100,616	$100,616
Grand Total	$8,596,619	$13,528,129	$22,124,748

FY2000

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM		$711,082	$711,082
CANADA	$292,696	$2,683	$295,379
CHINA - HONG KONG	$5,156		$5,156
CHINA - TAIPEI	$6,022		$6,022
COSTA RICA	$9,849		$9,849
FRANCE	$955,328	$2,907,548	$3,862,876
GERMANY	$132,415	$336,682	$469,097
ITALY		$373,229	$373,229
JAPAN	$1,794,718	$26,018	$1,820,736
NETHERLANDS	$412,686		$412,686
PANAMA	$14,252		$14,252
PHILIPPINES		$75,975	$75,975
PORTUGAL	$100,310	$1,232,020	$1,332,330
SINGAPORE		$29,768	$29,768
SOUTH KOREA	$7,590,832	$12,842,760	$20,433,592
SPAIN		$21,392	$21,392
SWEDEN	$7,075		$7,075
UNITED KINGDOM		$339,299	$339,299
VENEZUELA	$14,318		$14,318
Grand Total	$11,335,657	$18,898,456	$30,234,113

Table 75 Nominal value of monkfish exports by country and product form (fresh/frozen)

FY2001

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	$310,880	$333,133	$644,013
CANADA	$597,933		$597,933
CHINA		$6,731	$6,731
CHINA - HONG KONG	$6,104		$6,104
FRANCE	$1,517,641	$1,697,407	$3,215,048
GERMANY		$351,990	$351,990
INDONESIA		$82,233	$82,233
ITALY	$31,333		$31,333
JAPAN	$1,639,942	$373,422	$2,013,364
MALTA	$82,954	$15,000	$97,954
NETHERLANDS	$28,024	$173,000	$201,024
PORTUGAL	$179,491	$966,731	$1,146,222
SOUTH KOREA	$7,007,352	$23,990,124	$30,997,476
UNITED KINGDOM	$29,706	$72,944	$102,650
Grand Total	$11,431,360	$28,062,715	$39,494,075

FY2002

Sum of DOLLARS	PRODUCT		
COUNTRY	MONKFISH FRESH	MONKFISH FROZEN	Grand Total
BELGIUM	$18,808	$295,576	$314,384
CANADA	$548,715		$548,715
CAYMAN IS.	$17,996		$17,996
CHINA		$222,522	$222,522
CHINA - TAIPEI	$3,549		$3,549
FALKLAND IS.	$5,000		$5,000
FRANCE	$3,346,713	$1,089,530	$4,436,243
GERMANY		$225,008	$225,008
ITALY	$72,416	$112,647	$185,063
JAPAN	$958,392	$448,676	$1,407,068
KENYA	$10,500		$10,500
NETHERLANDS	$652,547		$652,547
PORTUGAL	$300,000	$556,098	$856,098
SOUTH KOREA	$4,564,873	$26,776,716	$31,341,589
SPAIN	$11,227		$11,227
UNITED KINGDOM	$3,519	$44,075	$47,594
Grand Total	$10,514,255	$29,770,848	$40,285,103

Table 75 Nominal value of monkfish exports by country and product form (fresh/frozen)

5.3.5 Bycatch

Monkfish is caught and landed both as the result of directed effort and as incidental catch in a number of other fisheries, particularly those using trawls, gillnets and scallop dredges. As noted in Section 5.3.1.1, monkfish limited access permit holders also hold permits in a number of other fisheries, and the number of trips landing monkfish as a component of a mixed catch far exceed the number of trips where monkfish is the dominant species. In general about 80 percent of the trips landing monkfish only account for about 20 percent of the total landings. In the NFMA, monkfish is primarily integrated with the multispecies fishery, while in the SFMA vessels fishing for scallops, dogfish, summer flounder, skates, squid, scup as well as multispecies, all land some amount of monkfish.

Monkfish landings and revenues as a percentage of total landings and revenues on vessels with a monkfish permit (limited and open access) are discussed in Section 5.3.2.2.3. The data presented there, particularly in Table 53 and Table 54, show the relative importance of monkfish and other species on vessels landing monkfish, and illustrate the wide variety of species with which monkfish is associated in the commercial catch. As a result of this intermixing of species and fisheries, the bycatch discussion is divided into three sections: bycatch of monkfish in directed monkfish fisheries, bycatch of other species in directed monkfish fisheries, and bycatch of monkfish in fisheries not targeting monkfish.

Information on bycatch is derived from VTR data and the observer program. Generally, VTR data, which is supplied by the vessel operator, is considered unreliable because of widely varying levels of compliance, non-standard methods for estimating discards, and other sources of error. The observer database, while providing precise estimates for those trips that are covered, does not comprise sufficiently large samples of trips across fisheries, gears, areas and seasons to make reliable estimates of discards fishery-wide. Nevertheless, the observer data does provide some insight into the types of discards occurring and the reasons for those discards (as the vessel operator tells the observer).

5.3.5.1 Bycatch of monkfish in directed monkfish fisheries

The degree of monkfish discards in the directed fishery, and the reasons for those discards vary with gear and area. For the purpose of this discussion, all trips that landed more than 400 lbs./DAS (landed weights) of monkfish are considered because the observer database does not specify whether landings are in tails or whole fish. There is no regulatory basis for designating a trip as "directed", and there is no other objective criterion for selecting a specific threshold for "directed' trips given the wide range of vessel sizes and landings. Consequently, the results give a relative snapshot, not the absolute amount of bycatch in "directed" fisheries. Some scallop dredge trips are included under the "directed" fishery, even though they are operating under a 300 lb./DAS (tails) incidental catch limit. On a percentage basis, the scallop dredge fishery has the highest discard ratio, primarily due to the minimum size regulations (Table 76 and Table 77). The gillnet fishery has a low occurrence of monkfish discards while the trawl fishery has a moderate but highly variable occurrence, again with the primary reason being "too small". SAW 34 also noted that the major reason for discarding was quality (gillnet) and size (both for market and regulations in the other fisheries). Since incidental catch limits, or trip limits are not a major reason for monkfish discards, it is valid to group observations in both management areas in this discussion.

	Gear	# trips	Monk Caught Lbs.	Monk Discarded Lbs.	Monk Discard as % of Monkfish Catch	Monk Discarded Too Small Lbs.	Monk Discarded too small as % of Monkfish Discards
North							
2001	**Gillnet > 10 "**	20	17,583	1,661	9%	20	1%
	Gillnet < 10 "	11	1,341	24	2%	24	100%
	Trawl	13	57,867	11,208	19%	11,098	99%
	Scallop	<3	108	66	61%	59	89%
2002	**Gillnet > 10 "**	87	117,900	2,699	2%	50	2%
	Gillnet < 10 "	43	18,026	524	3%	369	70%
	Trawl	103	604,614	66,450	11%	47,007	71%
	Scallop	7	10,213	3,862	38%	3,684	95%
South							
2001	**Gillnet > 10 "**	16	27,068	1,029	4%	69	7%
	Gillnet < 10 "	<3	0	0	0%	0	0%
	Trawl	0	-	-	NA	-	NA
	Scallop	5	10,146	3,481	34%	2,178	63%
2002	**Gillnet > 10 "**	67	161,728	772	0%	0	0%
	Gillnet < 10 "	0	-	-	NA	-	NA
	Trawl	14	8,929	2,699	30%	1,975	73%
	Scallop	6	22,400	8,053	36%	5,463	68%

Table 76 Monkfish discards on trips landing >400 lbs. of monkfish, observer data 2001 and 2002, showing the impact of the minimum size regulation or market cull.

North				South			
Dredge	Kept (mt)	Discard (mt)	Disc Ratio	**Dredge**	Kept (mt)	Discard (mt)	Disc Ratio
1996	4.46	1.43	0.32	1996	36.51	8.50	0.23
1997	9.64	1.51	0.16	1997	32.92	8.51	0.26
1998	6.40	0.36	0.06	1998	26.45	1.45	0.05
1999	0.63	0.07	0.11	1999	10.24	2.70	0.26
2000	0.19	0.03	0.15	2000	18.23	4.48	0.25
2001	0.05	0.03	0.61	2001	4.60	1.58	0.34
2002	4.63	1.75	0.38	2002	10.16	3.65	0.36
Average	3.71	0.74	0.25	Average	19.87	4.41	0.25
Gillnet	Kept (mt)	Discard (mt)	Disc Ratio	**Gillnet**	Kept (mt)	Discard (mt)	Disc Ratio
1996	4.06	0.55	0.14	1996	45.98	3.15	0.07
1997	3.20	0.35	0.11	1997	111.34	6.40	0.06
1998	5.91	0.24	0.04	1998	83.01	6.56	0.08
1999	7.06	0.16	0.02	1999	14.69	0.77	0.05
2000	19.01	1.35	0.07	2000	19.70	1.60	0.08
2001	8.58	0.76	0.09	2001	12.28	0.47	0.04
2002	61	1.00	0.02	2002	73.35	0.35	0.00
Average	15.52	0.63	0.07	Average	51.48	2.76	0.05
Trawl	Kept (mt)	Discard (mt)	Disc Ratio	**Trawl**	Kept (mt)	Discard (mt)	Disc Ratio
1996	41.88	8.02	0.19	1996	14.75	1.87	0.13
1997	35.20	3.28	0.09	1997	80.40	3.52	0.04
1998	6.81	0.78	0.11	1998	7.25	0.56	0.08
1999	16.73	1.18	0.07	1999	18.56	1.74	0.09
2000	114.10	9.13	0.08	2000	14.41	3.76	0.26
2001	26.24	5.08	0.19	2001	0.00	0.00	0.00
2002	274.20	30.14	0.11	2002	4.05	1.22	0.30
Average	73.60	8.23	0.12	Average	19.92	1.81	0.13

Table 77 SAW 34 observer data summary of discards (from tables C7 and C8) for 1996-2000, updated with observer data from 2001 and 2002 on trips landing>400 lbs of monkfish.

5.3.5.2 Bycatch of other species in the directed monkfish fishery

The bycatch of other species on monkfish trips landing more than 400 pounds of monkfish in 2001 and 2002 is shown in Table 78. Note that the number of trips observed is relatively small and variable by gear and area, although increased coverage in 2002 is evident, and, therefore, these results cannot be quantitatively expanded to describe the entire monkfish fishery. Nevertheless, a few obvious conclusions can be made, particularly that the overall rate of discards appears to be highest in trawl gear and lowest in large mesh gillnet fisheries. Winter skates and dogfish are the predominant species discarded in the NFMA, and winter and thorny skates, as well as dogfish are discarded in the SFMA.

In both trawl and gillnet fisheries, the reasons for discards (as the operator informed the observer) is "no market, reason not specified", at 65 and 56 percent, respectively. In the trawl fishery, the next most apparent reason is "too small", either due to no market or minimum size regulation. Regulations prohibiting retention, either outright or due to quota, comprise the next most significant reason. In the gillnet fishery, quota restrictions are the second most important reason, followed by "poor quality, sand flea damage" and "too small".

North											
2001					Percent of discards						
Gear	# trips	Total Catch	Total Discards	Total Discard %	MONKFISH	SKATE, WINTER	SKATE, THORNY	DOGFISH	LOBSTER	COD	CRAB, JONAH
Gillnet > 10 "	20	38,155	8,393	22	20	29	6	21	4	2	2
Gillnet < 10 "	11	18,994	4,262	22	1	1	2	60	3	12	2
Trawl	13	253,364	62,820	25	18	11	0	10	6	1	19
Scallop	<3	10,485	2,703	26	2	2	-	-	-	-	-
2002											
Gillnet > 10 "	87	204,908	16,989	8	8	55	3	9	3	3	6
Gillnet < 10 "	43	75,692	9,965	13	5	3	2	49	4	10	1
Trawl	103	4,182,331	1,340,904	32	5	19	4	10	2	1	3
Scallop	4	457,300	32,905	7	12	16	-	-	-	-	-

South										
2001					Percent of discards					
Gear	# trips	Total Catch	Total Discards	Total Discard %	MONKFISH	SKATE, WINTER	SKATE, THORNY	DOGFISH	BASS, STRIPED	WEAK-FISH
Gillnet > 10 "	16	34,916	3,376	10	30	18	14	11	-	-
Gillnet < 10 "	<3	944	365	39	-	-	8	-	68	8
Trawl	0	-	-	-	-	-	-	-	-	-
Scallop	5	351,342	54,970	16	6	32	3	0	-	-
2002										
Gillnet > 10 "	67	182,061	2,969	2	26	3	4	7	-	-
Gillnet < 10 "	0	-	-	-	-	-	-	-	-	-
Trawl	14	194,097	89,614	46	3	5	16	17	-	-
Scallop	6	674,142	81,762	12	10	11	25	-	-	-

Table 78 Observed bycatch of other species on trips landing >400 lbs. of monkfish in 2001 and 2002. Only species exceeding 1 percent of discards are shown (do not = 100%).

	%
Trawl	
REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED.	1.04
OTHER, DISCARDED	2.12
NO MARKET, QUOTA FILLED	2.31
REGULATIONS PROHIBIT ANY RETENTION.	2.42
REGULATIONS PROHIBIT RETENTION, QUOTA FILLED.	4.72
REGULATIONS PROHIBIT RETENTION, TOO SMALL	5.86
NO MARKET, TOO SMALL	14.27
NO MARKET, REASON NOT SPECIFIED.	64.96
Gillnet	
RETAINING ONLY CERTAIN SIZE BETTER PRICE TRIP QUOTA IN EFFECT.	1.09
POOR QUALITY, SHARK DAMAGE	1.11
OTHER, DISCARDED	1.46
REGULATIONS PROHIBIT RETENTION , WITH EGGS.	1.83
REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED.	2.21
REGULATIONS PROHIBIT RETENTION, TOO SMALL	2.93
POOR QUALITY, REASON NOT SPECIFIED	3.81
NO MARKET, TOO SMALL	4.17
POOR QUALITY, SANDFLEA DAMAGE	5.13
REGULATIONS PROHIBIT RETENTION, NO QUOTA IN AREA.	6.24
REGULATIONS PROHIBIT RETENTION, QUOTA FILLED.	12.40
NO MARKET, REASON NOT SPECIFIED.	55.56

Table 79 Reasons given to observers for discards of other species in trips landing >400 lbs. of monkfish.

5.3.5.2.1 Bycatch of red crab in directed monkfish fisheries

While red crab bycatch is a potential issue in deepwater monkfish fisheries due to their apparent co-location, observer data and commercial catch data do not show any bycatch, however, this may be due to lack of coverage or reporting. The Red crab FMP identified the bycatch of red crabs in the offshore monkfish fishery as a potential concern. Based on data from the 1974 NMFS bottom trawl survey (the survey used for the red crab assessment), 33 tows caught 1,436 red crabs (630 females and 806 males). The average water depth of the tows that caught red crabs from the NMFS bottom trawl survey was- approximately 565 meters. Figure 64 shows the locations where red crabs were caught in the survey. Monkfish otter trawl effort from the vessel trip report database has been added to the figure to show where there is potential overlap. While it would be more appropriate to compare effort and location of red crab from the same year, there is no effort data available from 1974, and there is no red crab location data available for 1999.

There is one source of more recent data from the F/V Mary K, which was involved in a cooperative NMFS/ industry monkfish survey in the Spring of 2001. In that survey, approximately 6,900 red crabs were caught in 24 tows (about 1800 females, and 5100 males) out of 53 tows at depths ranging from 115 m to 700 m (See Figure 65). The average water depth of the tows that caught red crabs was approximately 400 meters.

Some anecdotal reports suggest that bycatch levels of red crab may be quite high occasionally, and that the mortality of red crabs caught may be high as well. In order to determine this for sure, we need more information on the level of bycatch from this fishery, the mortality of red crab bycatch, and the sex and size distributions of the red crab bycatch.

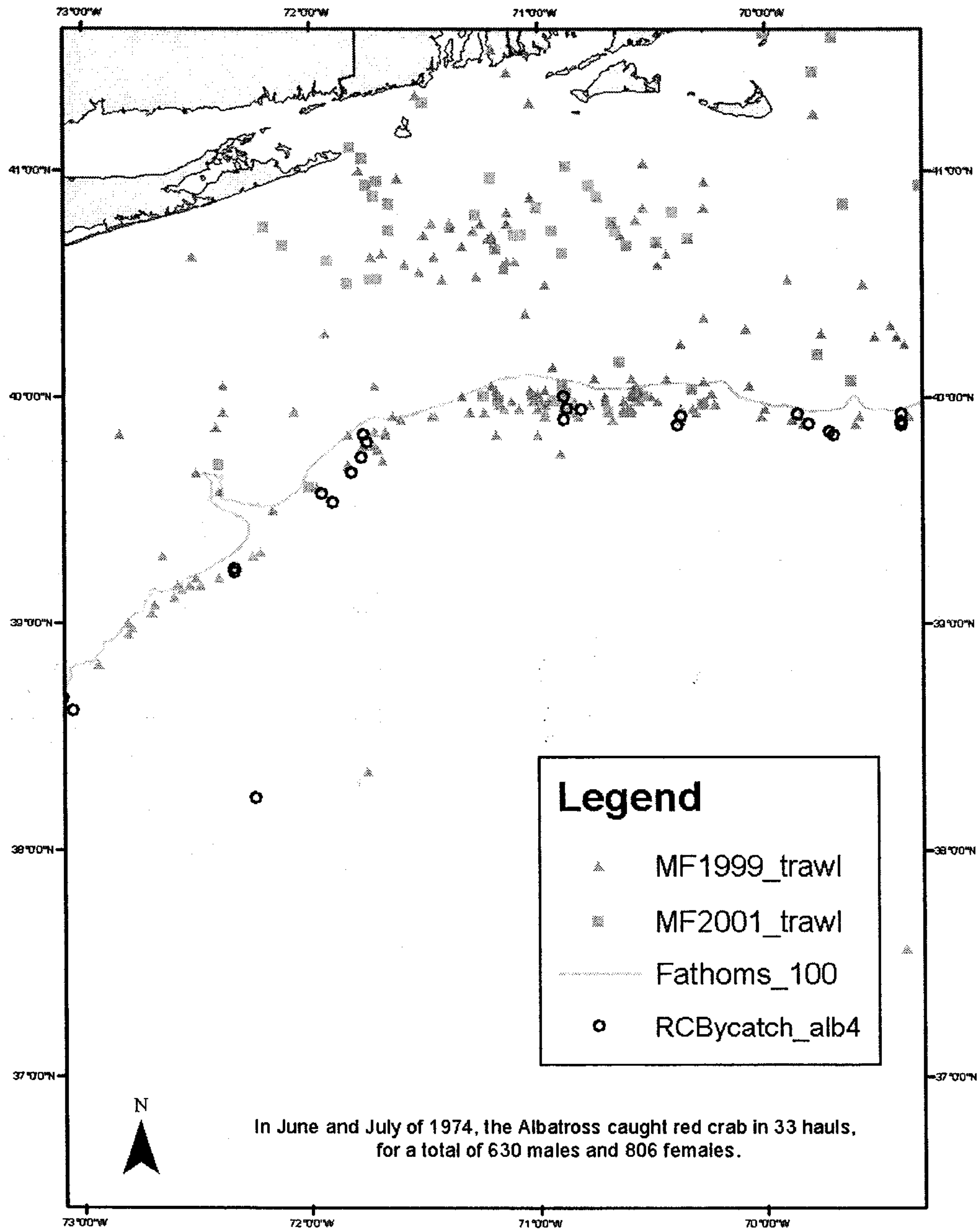


Figure 64 Display of where red crab was caught in 1974 on the Albatross survey as well as directed offshore monkfish trawl effort from fishing years 1999 and 2001

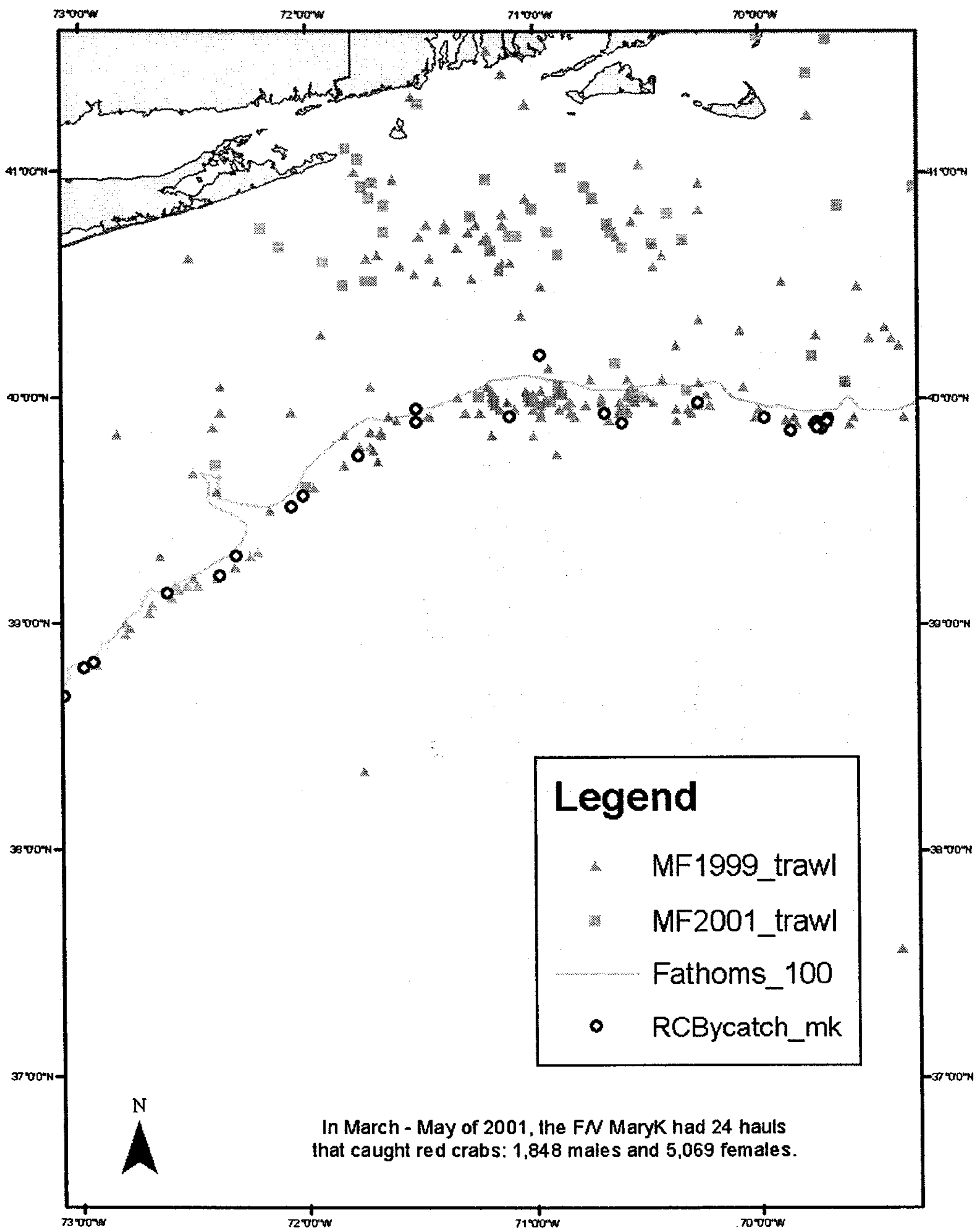


Figure 65 Display of where red crab was caught in the 2001 cooperative survey (F/V MaryK), as well as directed offshore monkfish trawl effort from fishing years 1999 and 2001

5.3.5.3 Bycatch of monkfish on non-directed trips

For this discussion, non-directed trips are those landing monkfish using scallop dredge or landing less than 400 lbs. of monkfish in 2002. As shown in Table 80, observer coverage was more extensive in the NFMA than the SFMA and on gillnet trips using mesh less than 10 inches and trawl trips. Based on these observations, in both areas, the percent of monkfish discarded is greatest on trawl and dredge trips, and insignificant on gillnet trips. On all three gears, the primary reason for monkfish discards is "too small", mostly due to the minimum size regulation but also to "no market" (Table 81). On gillnet trips, operators also attributed about the same amount of discards to "poor quality", including damage by hagfish, sand fleas and gear.

North	# trips	Monk Landed lbs.	Monk Discards	Monk total	Total Monk/trip	Landed Monk / Trip	Discards as % of Total monkfish
Gear							
Gillnet > 10 "	34	5,392	106	5,498	162	159	2%
Gillnet < 10 "	233	14,535	170	14,705	63	62	1%
Trawl	200	19,389	14,585	33,974	170	97	43%
Scallop	9	7,960	4,378	12,337	1,371	884	35%
South							
Gillnet > 10 "	<3	219	0	219	NA	NA	0%
Gillnet < 10 "	13	540	0	540	42	42	0%
Trawl	42	4,195	1,542	5,737	137	100	27%
Scallop	20	12,709	5,069	17,778	889	635	29%

Table 80 Observed bycatch of monkfish on non-directed trips (scallop dredge and those landing <400 lbs. of monkfish in 2002.

Trawl	%
NO MARKET, REASON NOT SPECIFIED.	1.74
NO MARKET, TOO SMALL	7.03
REGULATIONS PROHIBIT RETENTION, QUOTA FILLED.	7.47
REGULATIONS PROHIBIT RETENTION, TOO SMALL	83.69
Gillnet	
NO MARKET, TOO SMALL	1.45
NO MARKET, REASON NOT SPECIFIED.	3.62
POOR QUALITY, SANDFLEA DAMAGE	3.99
POOR QUALITY, GEAR DAMAGE	14.50
POOR QUALITY, HAGFISH DAMAGE	14.50
POOR QUALITY, REASON NOT SPECIFIED	22.83
REGULATIONS PROHIBIT RETENTION, TOO SMALL	39.11
Scallop Dredge	
REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED.	1.06
NO MARKET, TOO SMALL	15.35
NO MARKET, REASON NOT SPECIFIED.	24.79
REGULATIONS PROHIBIT RETENTION, TOO SMALL	56.69

Table 81 Reasons given to observers for discards of monkfish in non-directed trips (using scallop dredge or landing >400 lbs. of monkfish).

5.4 Habitat Considerations

5.4.1 Adverse Impacts Determination

The EFH Final Rule (50 CFR Part 600) provides guidance to the Regional Fishery Management Councils for identifying fishing activities that adversely impact essential fish habitat (EFH). In addition to the EFH Final Rule, guidance provided by the Habitat Conservation Division (HCD) headquarters office in the form of a memo dated October 2002 was followed in the preparation of this section of Amendment 13. This evaluation should primarily include the impacts of activities associated with the fishery that is the subject of the management action, as well as other federally managed and state-managed fishing activities. Based on the guidance provided by the EFH Final Rule and the HCD office, this determination focuses on the effects of fishing activities in the monkfish fishery on monkfish EFH and EFH of other species. It also includes information on the effects of other federally managed fishing activities on monkfish EFH, and identifies gears used in state-managed fisheries that could affect monkfish EFH. Most of the information needed to complete this determination is provided in more detail in Appendix II.

The EFH Final Rule also stipulates that "each FMP must minimize to the extent practicable the adverse effects of fishing on EFH that is designated under other federal FMPs. Federally managed species that are adversely affected by the monkfish fishery are listed in Appendix II. These species and life stages were ranked according to the vulnerability of their EFH to the effects of mobile, bottom-tending gear. EFH for those ranked as moderately or highly vulnerable were included in this adverse impacts evaluation.

For this determination, fishing activities are interpreted to mean fishing gears, since there is not enough information available to support a more detailed determination based on different fishing practices used with each gear type. Adverse impacts associated with each gear type are assessed for specific habitat types. Only benthic habitats are considered, since the gears used to catch monkfish are bottom-tending gears. Habitat type is based on type of substrate, and, to some extent, depth and degree of exposure to natural disturbance. These simplifications were made in order to allow maximum use of the information available and to provide an evaluation that encompasses as broad a range of the relevant fisheries and affected habitats as possible.

5.4.1.1 Structure of the EFH Adverse Impacts Determination

Section 1.2 of Appendix II describes commercial fishing gears used in the Northeast region of the U.S. and the geographic distribution and use of the principal bottom-tending gears in three broadly-defined habitat types. It also evaluates the effects of bottom trawls and dredges on benthic marine habitats in the region. Most of this information is derived from the NMFS, NEFMC and MAFMC-sponsored Gear Effects Workshop that evaluated the effects of fishing gears used in the Northeast region on mud, sand, and gravel habitats (NREFHSC 2002) and from an extensive review of relevant gear effects studies (Stevenson et al. 2003). Additional sources of information include work done by the NEFMC Habitat Technical Team and NEFMC and NMFS staff, and a National Research Council report on the Effects of Trawling and Dredging on Seafloor Habitat (NRC 2002). The information in this section serves as the basis for evaluating which gear types, if any, are most likely to have an adverse impact on essential fish habitat for federally managed species in the NE region.

Section 1.5 of Appendix II evaluates the vulnerability of all 37 federally mmanaged species' to gear types found to have potential adverse impacts on EFH. Vulnerability was evaluated according to four broad categories: none (0); low (L); moderate (M); and high (H), based upon a matrix analysis of habitat function, habitat sensitivity and gear use. Results are summarized by species and life stage.

Section 3.0 of Appendix II summarizes the results and findings of this section, identifying the potential adverse impacts of the principal mobile, bottom-tending gears on three principal bottom types in the region. These results serve as the basis for analyzing proposed alternatives to minimize the adverse impacts of these gears on EFH.

Section 5.4.2 of this EIS addresses non MAGNUSON-STEVENS Act fishing activities, and **Section 5.4.3** addresses non-fishing related activities, that may adversely affect essential fish habitat.

5.4.1.2 Description of Monkfish EFH Designations

The EFH text descriptions and map designations for the various life stages of Monkfish were defined in the Habitat Omnibus Amendment (1998). The following paragraphs and maps describe the environmental needs and natural distribution of Monkfish. For more information on Monkfish EFH refer the Habitat Omnibus Amendment (1998).

Essential Fish Habitat Description
Monkfish (Lophius americanus)

In its Report to Congress: Status of the Fisheries of the United States (September 1997), NMFS determined monkfish is currently overfished. This determination is based on an assessment of stock size. Essential Fish Habitat for monkfish is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 4.1 - 4.4 and meet the following conditions:

Eggs: *Surface waters of the Gulf of Maine, Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras, North Carolina as depicted in Figure 4.1. Generally, the following conditions exist where monkfish egg veils are found: sea surface temperatures below 18° C and water depths from 15 - 1000 meters. Monkfish egg veils are most often observed during the months from March to September.*

Larvae: *Pelagic waters of the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras, North Carolina as depicted in Figure 4.2. Generally, the following conditions exist where monkfish larvae are found: water temperatures 15° C and water depths from 25 - 1000 meters. Monkfish larvae are most often observed during the months from March to September.*

Juveniles: *Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud along the outer continental shelf in the middle Atlantic, the mid-shelf off southern New England, and all areas of the Gulf of Maine as depicted in Figure 4.3. Generally, the following conditions exist where monkfish juveniles are found: water temperatures below 13° C, depths from 25 - 200 meters, and a salinity range from 29.9 - 36.7‰.*

Adults: *Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud along the outer continental shelf in the middle Atlantic, the mid-shelf off southern New England, along the outer perimeter of Georges Bank and all areas of the Gulf of Maine as depicted in Figure 4.4. Generally, the following conditions exist where monkfish adults are found: water temperatures below 15° C, depths from 25 - 200 meters, and a salinity range from 29.9 - 36.7‰.*

Spawning Adults: *Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud along the outer continental shelf in the middle Atlantic, the mid-shelf off southern New England, along the outer perimeter of Georges Bank and all areas of the Gulf of Maine as depicted in Figure 4.4. Generally, the following conditions exist where spawning monkfish adults are found: water temperatures below 13° C, depths from 25 - 200 meters, and a salinity range from 29.9 - 36.7‰. Monkfish are observed spawning most often during the months from February to August.*

The Council acknowledges potential seasonal and spatial variability of the conditions generally associated with this species.

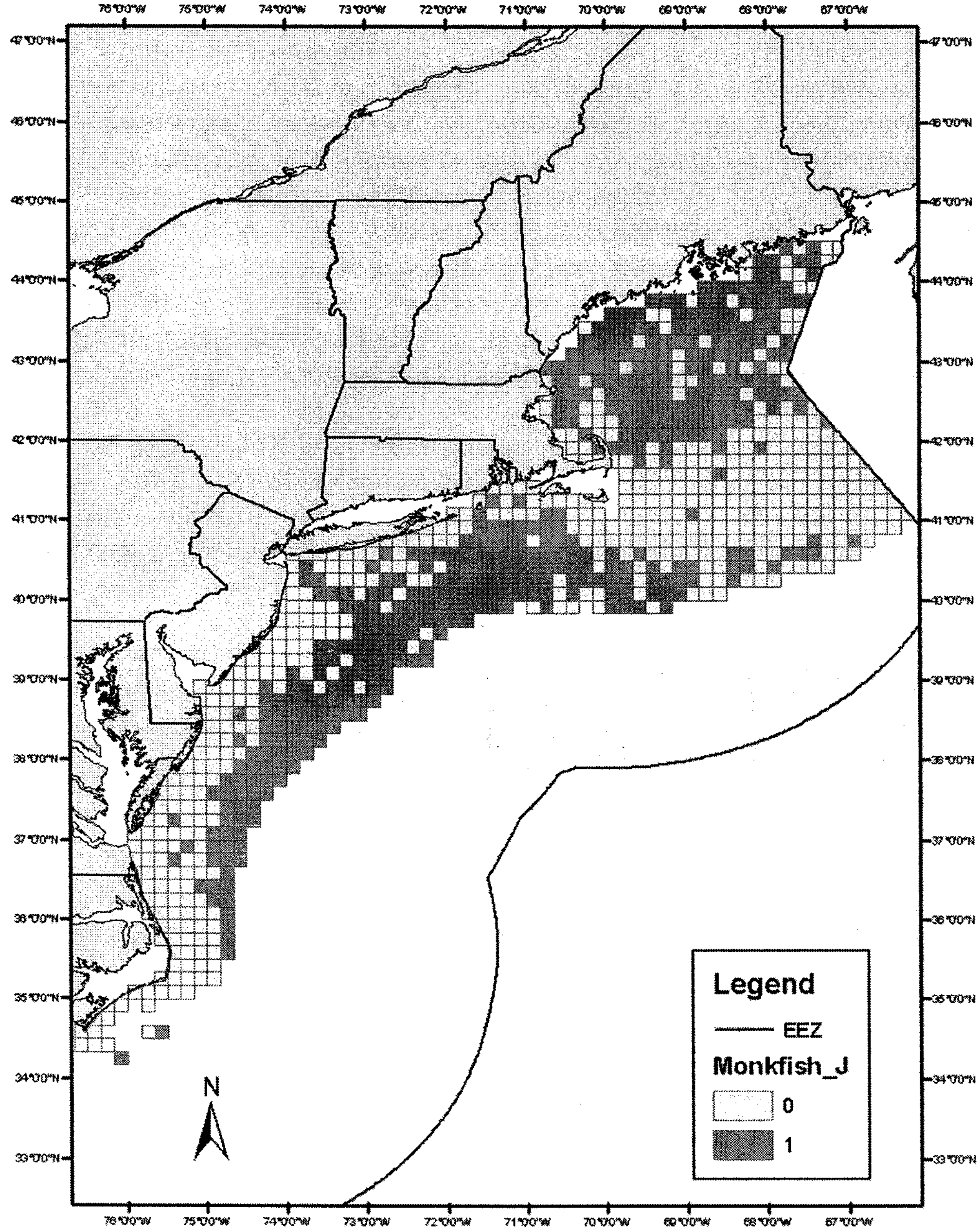


Figure 66 – EFH Designation for Juvenile Monkfish is highlighted in the shaded ten-minute squares

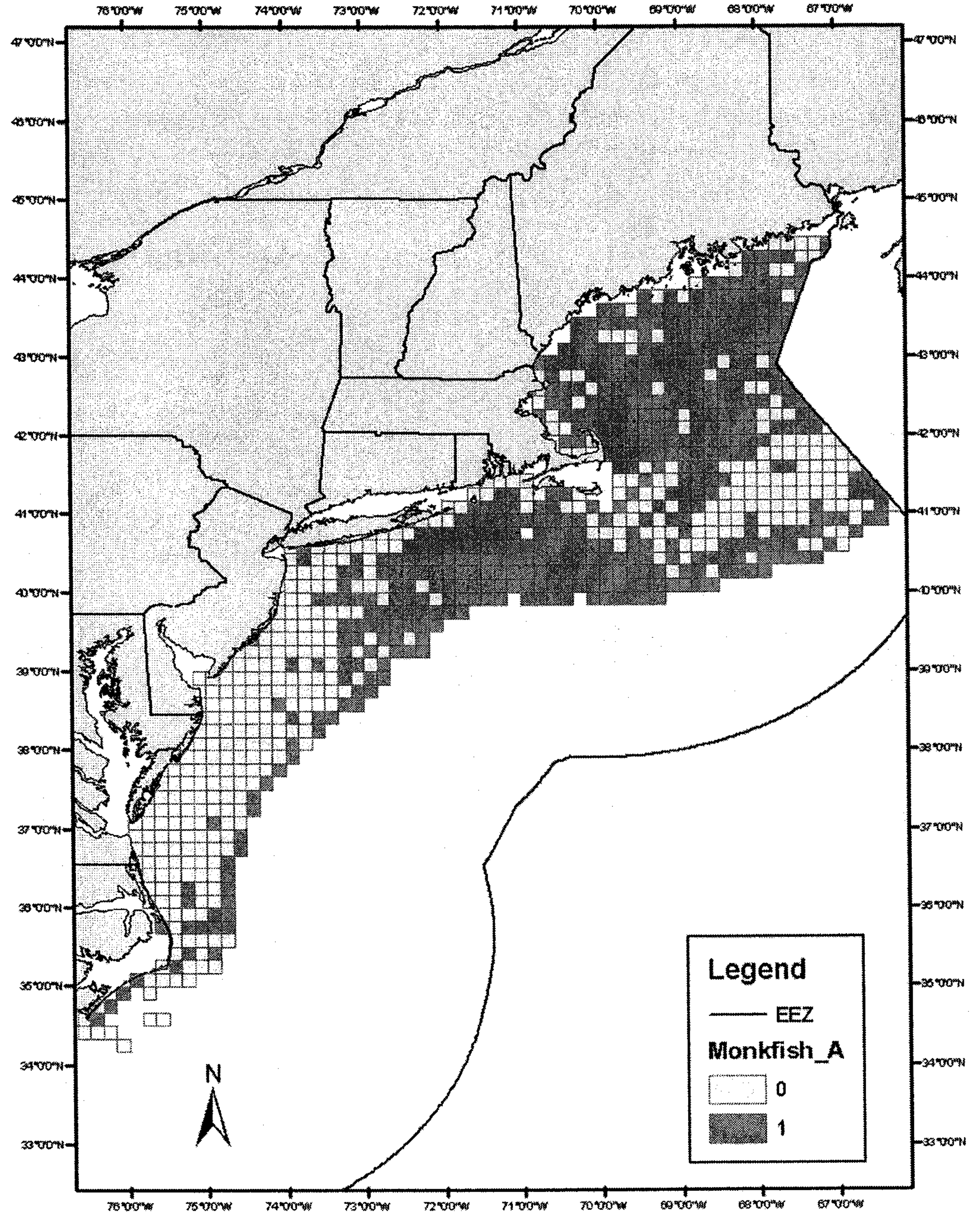


Figure 67 – EFH Designations for Adult Monkfish is highlighted in the shaded ten-minute squares

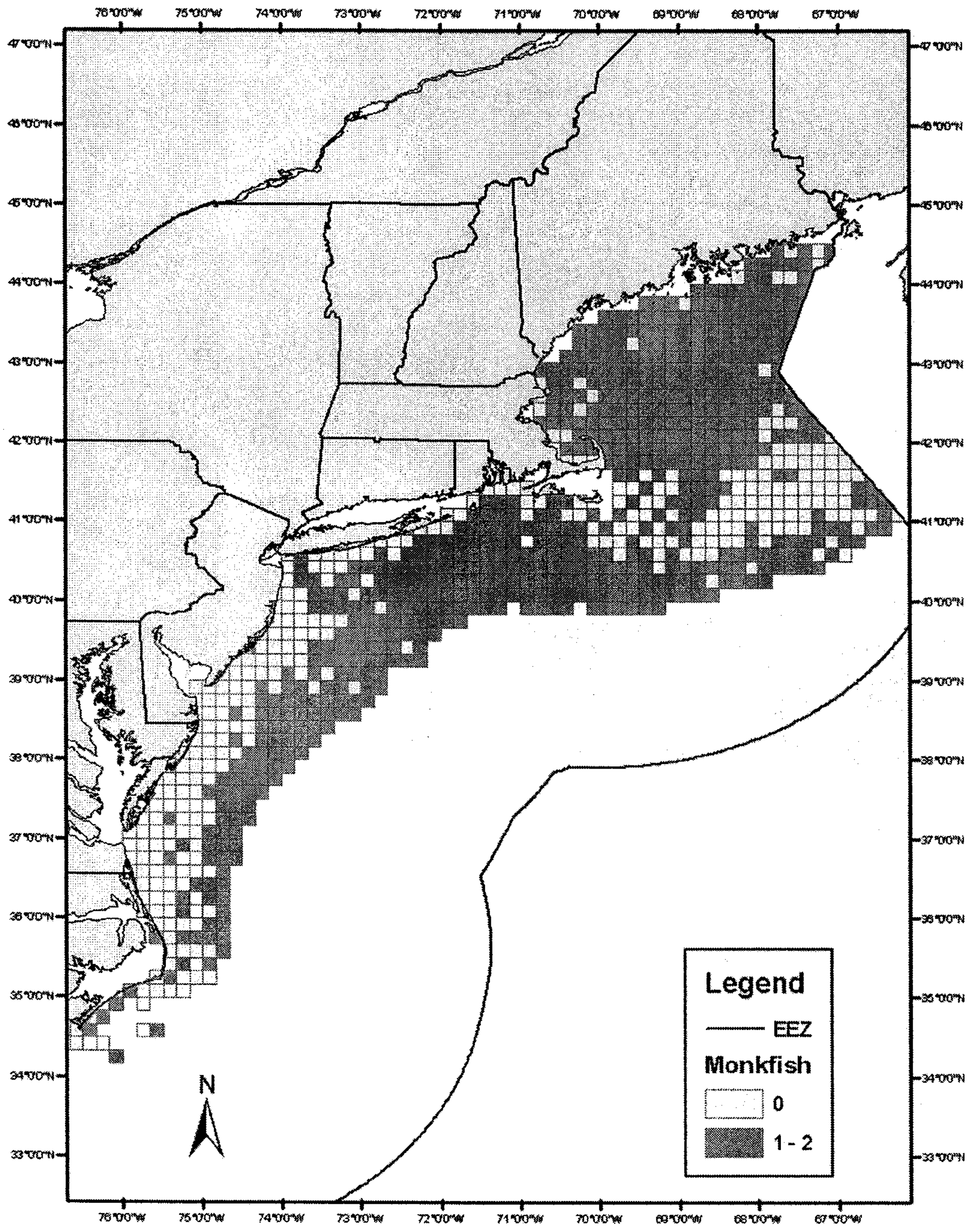


Figure 68 – EFH Designation for both Juvenile and Adult Monkfish combined is highlighted in the shaded ten-minute squares

Monkfish EFH has been determined to only be minimally vulnerable to bottom-tending mobile gear (bottom trawls and dredges) and bottom gillnets (see Appendix II). Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. However, the impacts of the monkfish fishery on the EFH of other species in the region with EFH that has been determined to be moderately or highly vulnerable to these gears must be assessed.

5.4.1.3 EFH of other Northeast Species

A list of species and life stages with EFH that has been determined to be adversely impacted by the Monkfish fishery are included in Table 82. Overall, there are 23 species with at least one life stage with EFH that is adversely impacted by bottom trawl gear. Thirteen of them have EFH designated in depths greater than 200 meters, and 5 of them occupy hard substrates in depths >200 m.

Species with EFH vulnerable to otter trawl gear:
American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), ocean pout (E, L, J, A), pollock (A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Species with vulnerable EFH designated in waters deeper than 200 meters are:
Atlantic halibut (A), Pollock (A), Redfish (J, A), Silver hake (J), Witch flounder (J, A), Tilefish (J, A), Barndoor skate (J, A), Clearnose skate (J, A), Rosette skate (J, A), Smooth skate (J, A), Thorny skate (J, A), Winter skate (J, A), and White hake (J).

Species with vulnerable EFH including waters deeper than 200 meters and containing hard substrate: Pollock (A), redfish (J, A), whiting (silver hake) (J), clearnose skate (J, A) and tilefish (J, A).

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150		Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175		Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	**adult**	**GOME, GB**	**100 - 700**		**Bottom habitats with a substrate of sand, gravel, or clay**
Atlantic salmon	juvenile	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny's, Passagassawaukeag, Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart and Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass. Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	10 - 61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 - 92 cm/s
Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, and silt
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100		Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Goosefish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Goosefish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80		Bottom habitats, often smooth bottom near rocks or algae
Offshore hake	**juvenile**	**Outer continental shelf of GB and southern NE south to Cape Hatteras, NC**	**170 - 350**		**Bottom habitats**
Offshore hake	**adult**	**Outer continental shelf of GB and southern NE south to Cape Hatteras, NC**	**150 - 380**		**Bottom habitats**
Pollock	**juvenile**	**GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay**	**0 – 250**		**Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks**
Pollock	**adult**	**GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound**	**15 – 365**		**Hard bottom habitats including artificial reefs**
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130		Bottom habitats in depressions with a substrate of sand and mud
Redfish	**juvenile**	**GOME, southern edge of GB**	**25 - 400**		**Bottom habitats with a substrate of silt, mud, or hard bottom**
Redfish	**adult**	**GOME, southern edge of GB**	**50 - 350**		**Bottom habitats with a substrate of silt, mud, or hard bottom**
White hake	**adult**	**GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay**	**5 - 325**		**Bottom habitats with substrate of mud or fine grained sand**
Silver hake	**juvenile**	**GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay**	**20 – 270**		**Bottom habitats of all substrate types**
Silver hake	**adult**	**GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay**	**30 – 325**		**Bottom habitats of all substrate types**
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 – 10 (1 - 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrates of mud, sand, grave
Witch flounder	**juvenile**	**GOME, outer continental shelf from GB south to Cape Hatteras**	**50 - 450 to 1500**		**Bottom habitats with fine grained substrate**
Witch flounder	**adult**	**GOME, outer continental shelf from GB south to Chesapeake Bay**	**25 - 300**		**Bottom habitats with fine grained substrate**
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Red crab	**juvenile**	**Southern flank of GB and south the Cape Hatteras, NC**	**700 - 1800**		**Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites**
Red crab	**adult**	**Southern flank of GB and south the Cape Hatteras, NC**	**200 - 1300**		**Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites**
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Found in coastal areas (April to December, peak June to November) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Wintering adults (November to April) offshore, south of NY to NC; inshore, estuaries from May to October	Structured habitats (natural and manmade), sand and shell substrates preferred
Ocean quahog	**juvenile**	**Eastern edge of GB and GOME throughout the Atlantic EEZ**	**8 - 245**		**Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras**
Ocean quahog	**adult**	**Eastern edge of GB and GOME throughout the Atlantic EEZ**	**8 - 245**	**Spawn May to December with several peaks**	**Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras**

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Spawn summer to fall	Throughout substrate to a depth of 3 ft within federal waters
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 -185)	Wintering adults (November to April) are usually offshore, south of NY to NC	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Spiny dogfish	**juvenile**	**GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay**	**10 - 390**		**Continental shelf waters and estuaries**
Spiny dogfish	**adult**	**GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay**	**10 - 450**		**Continental shelf waters and estuaries**
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150 m in colder months	Demersal waters and estuaries
Tilefish	**juvenile**	**US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)**	**76 - 365**	**All year, may leave GB in winter**	**Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris**
Tilefish	**adult**	**US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)**	**76 - 365**	**All year, may leave GB in winter**	**Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris**
Red drum	juvenile	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found throughout Chesapeake Bay from September to November	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars, and front beaches

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Red drum	adult	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast; shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs
Spanish mackerel, cobia, and king mackerel	juvenile	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Spanish mackerel, cobia, and king mackerel	adult	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Golden crab	**juvenile**	**Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)**	**290 - 570**		**Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat**
Golden crab	**adult**	**Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)**	**290 - 570**		**Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat**
Barndoor skate	**juvenile**	**Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon**	**10 - 750, mostly < 150**		**Bottom habitats with mud, gravel, and sand substrates**
Barndoor skate	**adult**	**Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon**	**10 - 750, mostly < 150**		**Bottom habitats with mud, gravel, and sand substrates**
Clearnose skate	**juvenile**	**GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem**	**0 – 500, mostly < 111**		**Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom**
Clearnose skate	**adult**	**GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem**	**0 – 500, mostly < 111**		**Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom**
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	**juvenile**	**Nantucket shoals and southern edge of GB to Cape Hatteras, NC**	**33 - 530, mostly 74 - 274**		**Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze**
Rosette skate	**adult**	**Nantucket shoals and southern edge of GB to Cape Hatteras, NC**	**33 - 530, mostly 74 - 274**		**Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze**

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	May to September	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

Table 82 – EFH definitions for all federally-managed species. Species with EFH vulnerable to bottom tending gear are shaded, and speices with EFH deeper than 200meters are in boldface.

5.4.1.4 Gear Descriptions

Commercial fishing gear types that contact the bottom and are defined for data-reporting purposes are listed in Table 88. Some of them are federally-regulated and others that are only used in state waters are not.

Federally regulated gears that contact the bottom can be divided into two types, mobile and stationary (or fixed) gears. Mobile, bottom-tending gears fall into two major groups, trawls and dredges. Types of trawls used in the Northeast region include otter trawls for fish, scallops, and shrimp, and Scottish and Danish seines. Federally-managed dredges include scallop and clam dredges. Bottom-tending fixed gears include sink and stake gill nets, long lines, pots and traps used to catch lobsters, crabs, and fish, and floating traps. Descriptions of these gears, and other gears used in the Northeast Region, are provided in Appendix II. The descriptions for trawls and dredges include some information on individual components that contact the bottom and some details about fishing practices (types of bottom fished, towing speeds, etc.). Bottom otter trawls are described as a single category, with some information on differences in gear design and configuration for trawls used to target particular resources (fish, scallops, or shrimp) or habitat types (smooth vs. rocky bottom). Of all the bottom-tending gears that have the potential to adversely affect benthic EFH in the NE region, bottom otter trawls are the most diverse group.

5.4.1.5 Distribution of Fishing Activity

The two gears used to harvest monkfish directly are bottom otter trawls and bottom gill nets. Monkfish are caught incidentally with other targeted species with both of these gears as well as scallop dredges. Information on the spatial distribution of fishing activity for these three gear types during 1995-2001 is provided in this section, the next section focuses on directed monkfish activity for FY1999 and FY2001. It is important to keep in mind that while dredge activity is reported in this document, dredge gear is not permitted to target Monkfish under the FMP while fishing on a Monkfish DAS. The geographic distributions of the ten minute squares (TMS) of latitude and longitude that accounted for most of the trips or days absent from port reported in the NMFS vessel trip database for these five gears are as follows:

Bottom gill net trips during 1995-2001 were made primarily in the Gulf of Maine (GOM). Gill net trips were most common in coastal waters in the southwestern portion of the GOM, with some trips reported offshore in the central portion of the Gulf. No gill net fishing was reported in coastal waters of central and eastern Maine. Outside the GOM, gill net trips were reported along the western side of the Great South Channel, in Rhode Island coastal waters, along the south shore of Long Island, and off New Jersey, the DelMarVa Peninsula, and North Carolina. A few trips were also made in three TMS along the 100 fathom contour at the shelf break in southern New England and (apparently) in a single TMS in even deeper water southeast of Hudson Canyon. Gill net trips made in federal waters were about five times more numerous during 1995-2001 than bottom longline trips.

Bottom trawling in federal waters in the Northeast region during 1995-2001 accounted for 150% more days absent from port as scallop dredging and 23 times more days absent than days spent fishing with clam dredges. Significant areas were closed to bottom trawlers on GB and in SNE.

Bottom trawling, more than any other fishing activity, was conducted to a greater extent in deeper water in the GOM, north of GB, and along the shelf break in SNE and the Mid-Atlantic (MA) region. A continuous area of high trawling activity occurred from the central GOM west to the coast, then through the southwestern GOM, down the west side of the Great South Channel and east across the top of Closed Area I on GB. Trawling was also reported west and south of Closed Area II on eastern GB, on the southern portion of GB, throughout most of SNE in inner, mid, and outer shelf waters, along the shelf break in the MA, and in North Carolina coastal waters. There was a large open access area with no, or minimal, trawling in the middle and inner portions of the MA shelf from the New York Bight south to the North Carolina border. Trawling activity was fairly evenly distributed among the four sub-regions of the Northeast shelf (see map of sub-regions).

Scallop dredging in federal waters in the Northeast region during 1995-2001 accounted for less than half as many days absent as bottom trawling, but nearly ten times more time at sea than was spent dredging with hydraulic clam dredges. Scallop dredging during 1995-2001 was reported in TMS along the eastern Maine coast, in the extreme southwestern "corner" of the GOM north of Cape Cod, along the western side of the Great South Channel, along the northern edge of GB and on its southeastern flank, and in a very large continuous area reaching from the eastern end of Long Island south across the shelf that included outer shelf waters as far south as the North Carolina border. Large expanses of bottom area in the outer GOM, in the central part of GB, in SNE, and in inner shelf waters of the MA did not support any notable amount of scallop dredging. Unlike bottom trawling, scallop dredging was almost completely confined to depths shallower than 50 fathoms. Analysis of VTR data by sub-region showed that about half of the reported scallop dredging days at sea were in the MA sub-region, about 30% in the GB sub-region (the same proportion as for trawls), 10% in SNE, and 5% or less in the GOM.

5.4.1.6 Distribution of Monkfish Fishing Activity and overlap with Vulnerable EFH and Substrate Type

The Monkfish fishery is described in more detail in Section 5.3. The fishery in the South is primarily a directed fishery, while Monkfish is more of a component fishery in the North. Figure 69 through Figure 71 depict the "directed" monkfish trips spatially by gear type for fishing years 1999 and 2001. A directed trip is defined in the analysis as any trip where total landings are made up of more than 50% monkfish, however the FMP only allows vessels using trawls or gillnets, but not dredges, to be fishing on a monkfish DAS. It is important to note that the Monkfish Plan does not permit directed effort by dredge gear. Therefore the very small number of trips that came up with more than 50% monkfish landings for dredge vessels are probably scallop trips that happened to land a significant portion of monkfish relative to the weight of scallops landed. Since dredge gears is not permitted to direct on Monkfish, it is more appropriate to manage this gear type for EFH impacts under a different FMP, such as the Sea Scallop FMP. Therefore, for the remainder of the adverse impacts determination, only bottom trawl effort will be considered, since gillnets have not been found to have adverse impacts on EFH. It is important to note that there is a significant amount of Monkfish landed as a component catch, particularly in the North. Since these vessels are targeting other species, and catching Monkfish incidentally, then it may be more appropriate to manage the impacts of these gears on EFH through other FMPs such as the Multispecies and Sea Scallop FMP. Fishing year 1999 was selected to show what fishing looked like just prior to the implementation of the FMP, and fishing year 2001 is the most recent year available to show current fishing effort (FY2002 data was not available). In general, most directed effort is by gillnet vessels, which have not been determined to have adverse impacts on EFH.

	1999		2001	
	Number of Trips	MF Landings (lbs)	Number of Trips	MF Landings (lbs)
Otter Trawl	817	5,941,012	640	6,358,009
Gillnet	3,991	10,409,092	5,451	12,547,883
Dredge	20	73,900	27	210,980
TOTAL	4,828	16,424,003	6,118	19,116,873

Table 83 – Number of trips and pounds of monkfish landed from "directed" Monkfish trips in 1999 and 2001

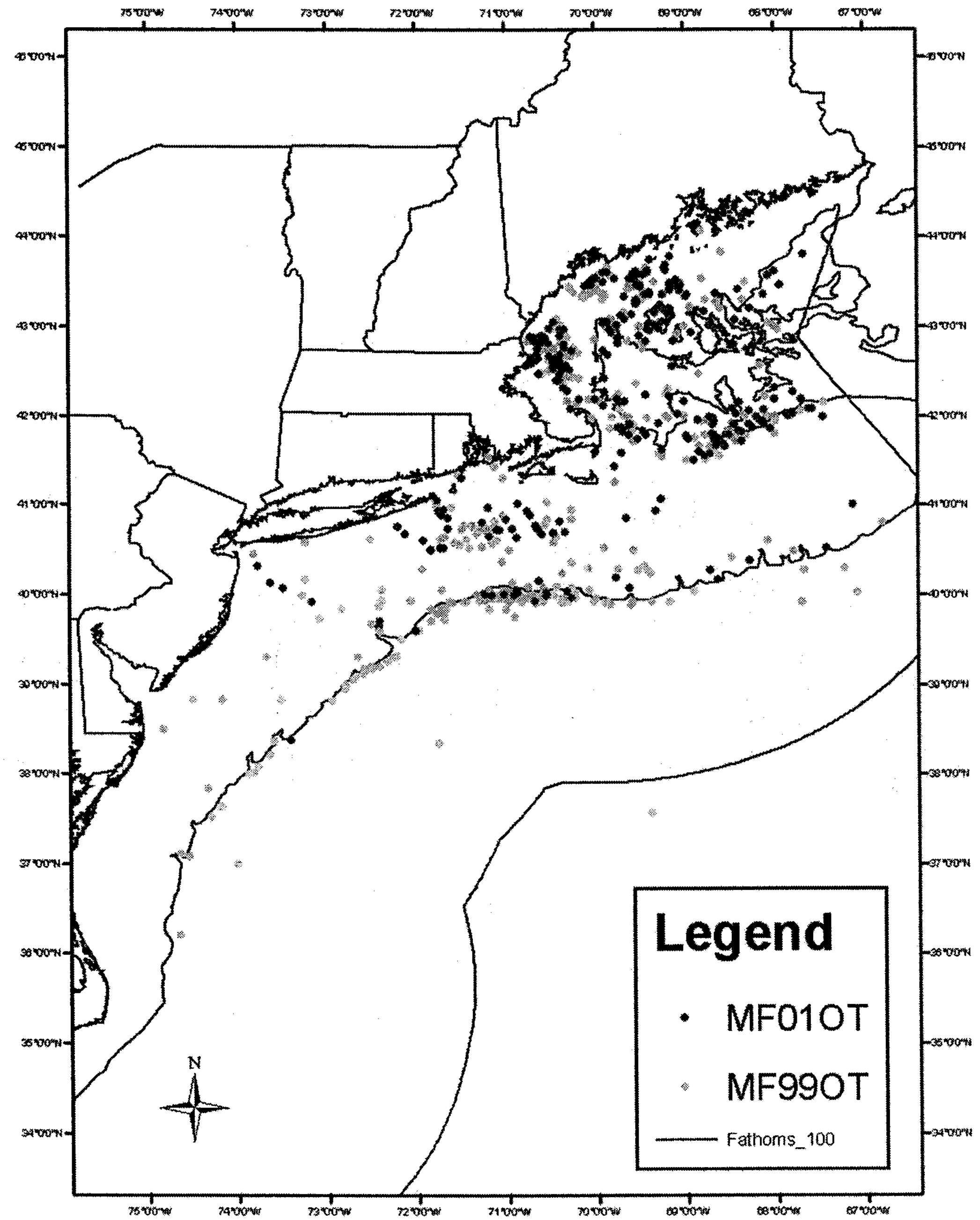


Figure 69 – Distribution of Directed Monkfish Otter Trawl Effort (from 1999 and 2001 VTR reports).
A directed trip is defined as any trip where monkfish landings are over 50% of total catch composition.

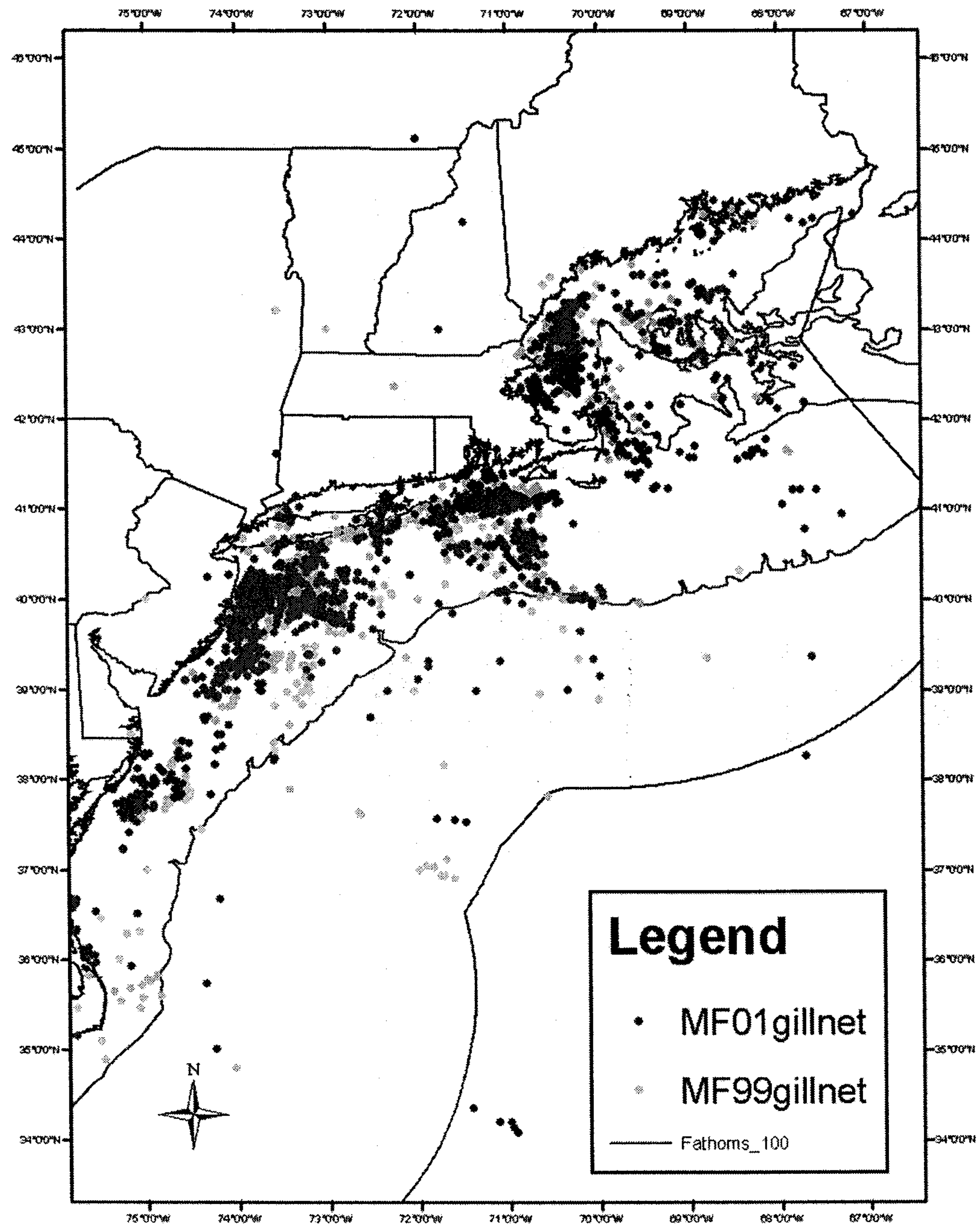


Figure 70 – Distribution of Directed Monkfish Gillnet Effort (from 1999 and 2001 VTR reports).

A directed trip is defined as any trip where monkfish landings are over 50% of total catch composition. Note that many of the 1999 values are covered up by 2001 data points that are right over or near to the same point.

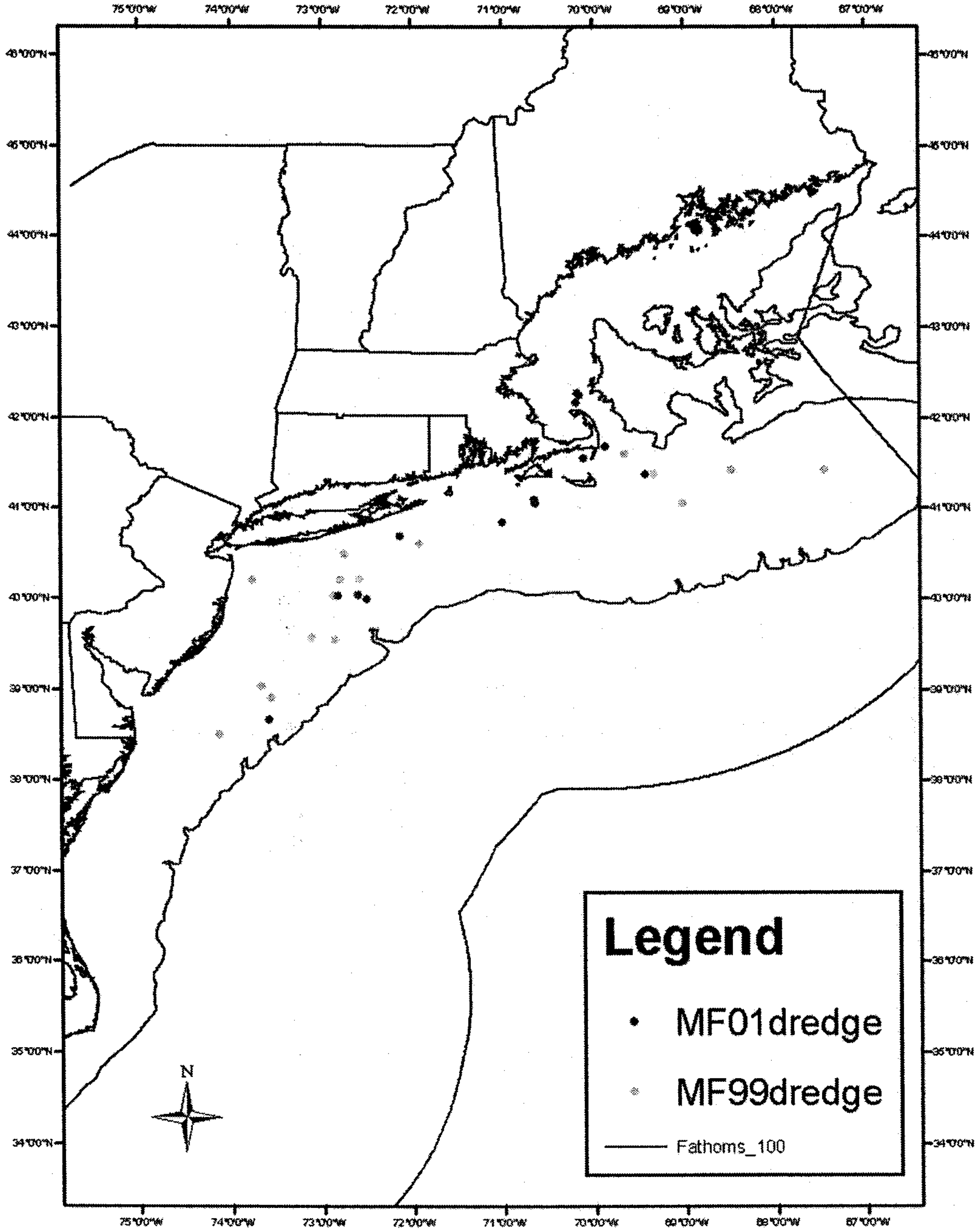


Figure 71 – Distribution of Directed Monkfish Dredge Effort (from 1999 and 2001 VTR reports).
A directed trip is defined as any trip where monkfish landings are over 50% of total catch composition.

The directed Monkfish effort in the region was then combined with EFH and sediment data to give a better description of the impacts of the monkfish fishery on EFH. The percent of directed effort that took place over vulnerable EFH was calculated, as well as the percent of total Monkfish landings that were harvested in those areas. This analysis focuses on the overlap of monkfish effort and EFH for species with EFH vulnerable to bottom tending gear, not all species in the region. Table 63 in Appendix II lists the species and life stages that are moderately or highly vulnerable to bottom tending gear, according to the vulnerability determination described in Section 1.5 of Appendix II. Table 84, Table 85, and Table 86 of this document describe the degree and extent to which the monkfish fishery prosecutes in areas with a.) Moderately and highly vulnerable EFH, b.) Highly vulnerable EFH, and c.) Monkfish EFH, respectively. Additionally, the percent of directed Monkfish effort that takes place over areas of Monkfish EFH has been determined for description purposes, even though Monkfish EFH has been determined to have low vulnerability to bottom tending gears.

		Species with Moderate and Highly Vulnerable EFH			
		JUVENILE		ADULT	
		# of Trips	MF Landings	# of Trips	MF Landings
1999	Trawl	612	3,632,412	610	3,590,875
	Gillnet	2686	6459651	2671	6446721
	Dredge	17	71242	17	71242
	TOTAL	3315	10163305	3298	10108839
2001	Trawl	378	3094208	378	3094208
	Gillnet	4504	9981007	4475	9948045
	Dredge	15	50941	15	50941
	TOTAL	4897	13126156	4868	13093194

Table 84 – Overlap of Monkfish Effort (Number of trips and directed monkfish landings by gear type) with EFH of species with moderate and highly vulnerable EFH

		Species with Highly Vulnerable EFH Only			
		JUVENILE		ADULT	
		# of Trips	MF Landings	# of Trips	MF Landings
1999	Trawl	567	3092864	509	2366928
	Gillnet	2485	5982315	2516	6047137
	Dredge	17	71242	15	69762
	TOTAL	3066	9146421	3040	8483827
2001	Trawl	373	3076974	367	2979559
	Gillnet	4141	9378245	4212	9522653
	Dredge	14	50821	14	50821
	TOTAL	4528	12506041	4593	12553033

Table 85 - Overlap of Monkfish Effort (Number of trips and directed monkfish landings by gear type) with EFH of species highly vulnerable EFH only

		Monkfish EFH Only			
		JUVENILE		ADULT	
		# of Trips	MF Landings	# of Trips	MF Landings
1999	Trawl	452	2089557	539	3,269,939
	Gillnet	1151	3398101	1357	3829541
	Dredge	8	13119	9	25721
	TOTAL	1611	5500777	1905	7125201
2001	Trawl	251	1715305	328	2830824
	Gillnet	1719	4878346	2163	5942522
	Dredge	7	38020	13	25821
	TOTAL	1977	6631671	2504	8799167

Table 86 - Overlap of Monkfish Effort (Number of trips and directed monkfish landings by gear type) with Monkfish EFH

The percent of directed effort and percent of monkfish landings from those trips was also compared with each sediment type found in the region. For description purposes it is helpful to evaluate what sediment type the majority of effort is taking place. The sediment data is based on the Poppe et al database. Table 87 and Table 88 describe where directed monkfish effort took place in 1999 and 2001, in terms of sediment type. The dredge effort is insignificant because according to the Monkfish FMP dredge gear cannot be used to direct on Monkfish. Furthermore, it is interesting to evaluate where the gillnet effort is taking place in terms of sediment type, but this gear does not adversely impact EFH. Therefore, it is most pertinent to determine on what sediment types the directed trawl effort is taking place and according to the tables below, the majority of directed monkfish trawl effort is over mud and sand.

		1999			
		Trawl	**Gillnet**	**Dredge**	**1999 Total**
% over Bedrock	# of Trips	0	0	0	0
	MF landings	0	0	0	0
% over Gravel	# of Trips	1(<1%)	30(1%)	0	31(<1%)
	MF landings	350(<1%)	35117(<1%)	0	35467(<1%)
% over Gravely-Sand	# of Trips	15(2%)	371(14%)	2(12%)	388(11%)
	MF landings	42466(1%)	638495(10%)	22(<1%)	698092(7%)
% over Sand	# of Trips	156(25%)	1783(65%)	14(82%)	1953(58%)
	MF landings	1338251(34%)	4538125(69%)	17132(24%)	5930464(56%)
% over Muddy Sand	# of Trips	146(23%)	165(6%)	1(6%)	312(9%)
	MF landings	1456814(37%)	531806(8%)	54088(76%)	1988643(19%)
% over Mud	# of Trips	309(49%)	389(14%)	0	698(21%)
	MF landings	1068845(27%)	872078(13%)	0	1940924(18%)
TOTAL	**# of Trips**	**627**	**2738**	**17**	**3382**
	MF landings	**3906727**	**6615622**	**71242**	**10593590**

Table 87 - Percent of directed Monkfish trips and total monkfish landings from FY 1999, versus the sediment type associated with each trip.

(Poppe sediment data overlapped with the location of each directed monkfish trip from the VTR database).

		2001			
		Trawl	Gillnet	Dredge	2001 TOTAL
% over Bedrock	# of Trips	0	10(0.2%)	0	10(<1%)
	MF landings	0	7217 (<1%)	0	7217 (<1%)
% over Gravel	# of Trips	1(0.3%)	133(3%)	0	134(3%)
	MF landings	7779 (<1%)	172254 (2%)	0	180033 (1%)
% over Gravely-Sand	# of Trips	11(3%)	768(17%)	1(6%)	780(16%)
	MF landings	87297 (3%)	1345725 (13%)	600 (1%)	1433622 (11%)
% over Sand	# of Trips	105(27%)	2630(58%)	15(94%)	2750(56%)
	MF landings	1077714 (34%)	5599117 (55%)	50353 (99%)	6727184 (51%)
% over Muddy Sand	# of Trips	34(9%)	369(8%)	0	403(8%)
	MF landings	361071 (11%)	1242637 (12%)	0	1603708 (12%)
% over Mud	# of Trips	233(61%)	635(14%)	0	868(18%)
	MF landings	1619018 (51%)	1732769 (17%)	0	3351787 (25%)
TOTAL	**# of Trips**	**384**	**4545**	**16**	**4945**
	MF landings	**3152880**	**6615622**	**50953**	**10593591**

Table 88 - Percent of directed Monkfish trips and total monkfish landings from FY 2001, versus the sediment type associated with each trip
(Poppe sediment data overlapped with the location of each directed monkfish trip from the VTR database).

5.4.1.7 Gears Used In Monkfish Fishery that Adversely Affect EFH

Of the two directed gear types (bottom otter trawls and bottom gillnets) used to harvest monkfish that are managed under the NEFMC Monkfish FMP or which are used in other federally-managed fisheries, only bottom other trawls have been determined to adversely affect benthic EFH. This conclusion is based on two recent reports. The first of these (NREFHSC 2002) is the report of a workshop held in October 2001 that examined the habitat effects of gears used in the Northeast region on three substrate types (gravel, sand, and mud). A panel of experts concluded that otter trawls is one of two gears with the highest priority in terms of impacts, with minimal impacts for clam dredges, nets and lines, and pots and traps. While scallop dredge gear does land monkfish, this is not a gear type that is permitted to direct on monkfish under a Monkfish DAS, therefore the adverse impacts of this gear type on vulnerable EFH are managed under the Scallop FMP.

The second report (Morgan and Chuenpagdee 2003) evaluated the effects of ten different commercial fishing gears on marine ecosystems in U.S. waters. It differentiated between habitat impacts and by-catch issues and listed the effects of each gear type in more detail than the first report. (It also relied on input from a larger group of experts and used more scientifically based methods for collecting and analyzing the information). The report concluded that bottom trawls and dredges have very high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. Individual types of trawls and dredges were not evaluated. The impacts of bottom gill nets, traps, and longlines were limited to warm or shallow-water environments with rooted aquatic vegetation or "live bottom" environments (e.g., coral reefs).

5.4.2 Non Magnuson-Stevens Act Fishing Activities

There are a number of fishing activities that may adversely affect EFH that are not necessarily managed under the Magnuson-Stevens Act. For example, state fisheries, some recreational fisheries, subsistence fishing, and even research projects. When these activities are added together, they may have the potential to cumulatively impact habitat. It is difficult to keep track of every non-Magnuson fishing activity and measure all of these activities occurring along the coast, but the EFH Regional Steering Committee has gathered information about the various fishing gears used in the Northeastern United States and their potential effects on EFH. Table 89 describes the fishing gears used in estuaries and bays, coastal waters, and offshore waters of the EEZ from Maine to North Carolina. Notice the variety of gears used in state waters for non-Magnuson related fishing activities, and whether these gears come in contact with the bottom or not.

GEAR	Estuary or Bay	Coastal 0-3 Miles	Offshore 3-200 Miles	Contacts Bottom	Federally Regulated
Bag Nets	X	X	X		X
Beam Trawls	X	X	X	X	X
By Hand	X	X			X
Cast Nets	X	X	X		
Clam Kicking	X			X	
Diving Outfits	X	X	X		
Dredge Clam	X	X	X	X	X
Dredge Conch	X			X	
Dredge Crab	X	X		X	
Dredge Mussel	X	X		X	
Dredge Oyster, Common	X			X	
Dredge Scallop, Bay	X			X	
Dredge Scallop, Sea		X	X	X	X
Dredge Urchin, Sea		X	X	X	
Floating Traps (Shallow)	X	X		X	X
Fyke And Hoop Nets, Fish	X	X		X	
Gill Nets, Drift, Other			X		X
Gill Nets, Drift, Runaround			X		X
Gill Nets, Sink/Anchor, Other	X	X	X	X	X
Gill Nets, Stake			X	X	X
Haul Seines, Beach	X	X		X	
Haul Seines, Long	X	X		X	
Haul Seines, Long(Danish)		X	X	X	X
Hoes	X			X	
Lines Hand, Other	X	X	X		X
Lines Long Set With Hooks		X	X	X	X
Lines Long, Reef Fish		X	X	X	X
Lines Long, Shark		X	X		X
Lines Troll, Other		X	X		X
Lines Trot With Baits		X	X		X
Otter Trawl Bottom, Crab	X	X	X	X	
Otter Trawl Bottom, Fish	X	X	X	X	X

Otter Trawl Bottom, Scallop		X	X	X	X
Otter Trawl Bottom, Shrimp	X	X	X	X	X
Otter Trawl Midwater		X	X		X
Pots And Traps, Conch	X	X		X	
Pots and Traps, Crab, Blue Peeler	X	X		X	
Pots And Traps, Crab, Blue	X	X		X	
Pots And Traps, Crab, Other	X	X	X	X	X
Pots And Traps, Eel	X	X		X	
Pots and Traps, Lobster Inshore	X	X		X	
Pots and Traps, Lobster Offshore			X	X	X
Pots and Traps, Fish	X	X	X	X	X
Pound Nets, Crab	X	X		X	
Pound Nets, Fish	X	X		X	
Purse Seines, Herring		X	X		X
Purse Seines, Menhaden		X	X		
Rakes	X			X	
Reel, Electric or Hydraulic		X	X		X
Rod and Reel	X	X	X		X
Scottish Seine		X	X	X	X
Scrapes	X			X	
Spears	X	X	X		
Stop Seines	X			X	
Tongs and Grabs, Oyster	X			X	
Tongs Patent, Clam Other	X			X	
Tongs Patent, Oyster	X			X	
Trawl Midwater, Paired		X	X		X
Weirs	X			X	

Table 89- Fishing gears used in estuaries and bays, coastal waters, and offshore waters of the EEZ, from Maine to North Carolina.

Includes all gear responsible for 1% or greater of any state's total landings and all gear that harvested any amount of federally managed species.

Entries in bold type are gears that are federally managed and contact the bottom

Based upon 1999 NMFS landings data and 2000 ASMFC Gear Report

The New England Council has initiated Amendment 3 to the Monkfish FMP, which is part of a larger Omnibus EFH Amendment that will review and revise the EFH components of all the Council's FMPs. In this review, the Non-Magnuson Act fishing activities that may adversely affect EFH will be updated. The estimated completion date for this action is year-end 2007.

5.4.3 Non-Fishing Related Activites

The Omnibus Habitat Amendment (1998), Amendment 1 to the Monkfish FMP, identified numerous potential non-fishing threats to essential fish habitat. The chemical, biological, and physical threats to riverine, inshore, and offshore habitats are extensively discussed in Section 5.2 of the Omnibus document. Overall, the major threats to marine and aquatic habitats are a result of increasing human population and coastal development, which is contributing to an increase of human generated pollutants. These pollutants are being discharged directly into riverine and inshore habitats by way of both *point* and *non-point* sources of pollution. Point sources of pollution include industrial discharge, power plants, sewage treatment plants, disposal of dredged materials, energy and mineral exploration, marine transportation, coastal and port development, and erosion. Non-point sources include run-off, wildlife feces, industrial shipping, recreational boating, septic systems, and contaminated groundwater and sediments. Table 90 summarizes the Non-Fishing Related Threats to EFH. Refer to Amendment 11 to the Northeast Multispecies FMP (1998) for a more complete discussion of these potential threats.

The New England Council has initiated Amendment 3 to the Monkfish FMP, which is part of a larger Omnibus EFH Amendment that will review and revise the EFH components of all the Council's FMPs. In this review, the non-fishing activities that may adversely affect EFH will be updated. The estimated completion date for this action is year-end 2007.

THREATS	Chemical												Biological			Physical																		
																				ero					dive				mini					
ACTIVITIES & SOURCES ("2°" ≡ secondary source)	oil	heavy metals	nutrients	pesticides	herbicides / fungicide	acid	chlorine	thermal	metabolic / food wastes	suspended particles	radioactive wastes	greenhouse gases	exotic / reared	nuisance / toxic algae	pathogens	channel dredge	dredge and fill	marina/dock construction	vessel activity	bulkheads	seawalls	jetties	groins	tidal restriction	dam	water withdrawal	irrigation	deforestation	gravel / mineral mining	oil / gas mining	peat mining	debris	artificial reefs	dredged material
non-point sources																																		
municipal run-off	X	X	X	X	X	X			X	X	X			X	X																	X		
agricultural run-off	X	X	X	X	X	X			X	X				X	X																			
atmospheric deposition		X	X	X	X	X				X	X	X																						
wildlife feces			X						X					X	X																			
septic systems			X				X		X					X	X																			
industrial shipping	X	X	X							X			X	X	X	X		X	X										X	X	X	X		X
recreational boating	X	X	X							X			X	X		X		X	X													X		X
contaminated groundwater		X	X	X	X	X	X				X			X																				
contaminated sediments	X	X	X	X							X			X																				X
nuisance / toxic algae (2°)			X						X						X																			
point sources																																		
industrial discharge		X	X			X	X	X	X	X	X			X																				
power plants	X	X					X	X			X														X									
sewage treatment plants			X			X	X		X					X	X																			
ocean disposal of dredged	X	X	X	X						X				X																				
aquariums			X										X		X																			
biotechnology labs													X		X																			
silviculture			X						X	X				X														X						
water diversion			X	X	X					X				X	X									X	X	X	X							
decaying shoreline																		X	X													X		
energy and mineral	X		X							X				X															X	X	X			X
marine transportation	X	X								X						X		X	X															X
coastal development			X	X	X											X	X	X	X	X	X	X	X	X	X	X	X	X						X
port / harbor development																X	X	X	X	X	X	X	X	X	X			X				X		X
erosion control										X										X	X	X	X	X	X									

Table 90- Non-Fishing Related Threats to EFH and Activities and Sources Contributing the Threats

Source: Habitat Omnibus Amendment (1998)

5.4.4 Conservation and Enhancement

The Magnuson-Stevens Fishery Conservation and Management Act requires all fishery management plans (FMPs) to identify actions to promote the conservation and management of fishery resources. Prior to the concept of essential fish habitat (EFH), conservation primarily involved management measures to reduce overfishing and rebuild overfished stocks. The Habitat Omnibus Amendment (1998) strengthened the role of the New England Fishery Management Council to further conserve and enhance EFH and related fishery resources. Section 6.0 of the EFH Amendment describes options to avoid, minimize, or compensate for the adverse effects of activities identifies as non-fishing threats to essential fish habitat.

The conservation and enhancement options promoted by the Council include, as directed in the Interim Final Rule: the enhancement of rivers, streams, and coastal areas; improving water quality and quantity; watershed analysis and planning; and habitat creation. The Habitat Omnibus Amendment detailed recommendations to address fishing threats including chemical, biological, and physical threats. Furthermore, the state, non-profit, and other federal agencies that are working with the Council to develop programs to monitor and research habitat are highlighted in that document as well.

5.4.5 Prey Species

In addition to the monkfish-specific information contained in Section 5.1.5, Appendix A of the Habitat Omnibus Amendment (1998) describes the life history and habitat characteristics of all Council-managed species. The abundance of major prey items in the diet of these managed species are listed within the Appendix, which are based on the NEFSC bottom trawl survey data. This information is important to consider when analyzing prey species and essential fish habitat, however existing law does not require the Council to define prey species as EFH. Technical guidance from NOAA general counsel encouraged the Councils to identify the prey species for the species managed under the FMP and describe the habitat of those significant prey species to aid in the determination of adverse effects to their habitat. This information should be included in the "adverse effects" section of the EFH FMP, rather than the description and identification section. Therefore, the Habitat Omnibus Amendment is sufficient to date, and the EFH Source Documents should be referred to when evaluating adverse effects of EFH (Appendix A of EFH Amendment).

5.4.6 Research and Information Needs

The regulatory text of the EFH Final Rule directs the Council to include in the EFH amendment recommendations, preferably in priority order, for research efforts that the Council and NMFS view as necessary for carrying out their EFH management mandate. The need for additional research is to make available sufficient information to support a higher level of description and identification of EFH. Additional research may also be necessary to identify and evaluate actual and potential adverse effects on EFH including, but not limited to, direct physical alteration, impaired habitat quality/functions, cumulative impacts from fishing, or indirect adverse effects such as sea level rise, global warming and climate shifts, and non-equipment related fishery impacts. The need for additional research on the effects of fishing equipment on EFH is also included. The research needed to quantify and mitigate adverse effects on EFH is identified in this amendment as well.

The Council hopes to coordinate with NMFS in identifying research priorities for EFH; therefore, the Council supports the recent work compiled by the Northeast Region EFH Steering Committee (2000). Table 91 describes the habitat research needs as identified by EFH Steering Committee. Five major research categories were identified: habitat characterization needs, gear impacts, specific habitat studies, data collection needs, and anthropogenic impacts. Research priority is given when appropriate, and potential funding sources are identified as well. The Habitat Technical Team recognizes that all research priorities are important, but the cost and length of a project are critical factors in determining its overall priority. The length of recovery for a specific habitat type may be a realistic goal for short-term research, but until a determination is made on how fish are linked to these habitats, management will not benefit from these projects. The Council's EFH Technical Team identified high-resolution mapping of the ocean floor as the research need with the highest benefit to EFH research, but is also the most expensive. It is important for the Council to assist the research community to identify what habitat research is currently taking place, so future research can be directed to complete these projects into one integrated EFH dataset for the Northwest Atlantic.

Research Category	Research Need	Priority	Potential Funding Source	Council/ ASMFC Interest
Habitat Characterization Needs	Provide high resolution benthic/sediment mapping of mid-Atlantic and New England areas # Identify and describe biogenic structure and biological communities associated with different physical habitat types # Develop mechanism for fishing industry-supported, high resolution sediment mapping in the Gulf of Maine and Georges Bank. Use Canadian sea scallop industry mapping effort as an example to establish process for similar mapping efforts in U.S. waters	HIGH HIGH HIGH	Examples - NOAA (Habitat Characterization Initiative?), NMFS, Sea Grant, Councils NE Cooperative Research Funds	All All NEFMC
	Identify nursery and overwintering habitats for black sea bass	HIGH	MAFMC-TAC	MAFMC ASMFC
	Identify nursery and overwintering habitats for scup	Med.	MAFMC-TAC	MAFMC ASMFC
	Identify Loligo squid spawning areas	Med.	MAFMC-TAC	MAFMC
	Identify dogfish pupping areas	Med.	MAFMC-TAC	All
	Identify Atlantic herring spawning areas	Med.		NEFMC ASMFC
	Identify spring spawning bluefish areas in South Atlantic Bight	Low		MAFMC ASMFC
	Refine identification of summer flounder nursery habitat	Low		MAFMC ASMFC
Gear Impacts	Assess effects of specific mobile bottom gear types along a gradient of effort, on specific habitat types # Effects on tilefish burrows # Effects on Loligo egg mops # Effects on soft muddy bottom communities # Identify and compare/contrast impacts to a variety of habitat types (mud, sand, gravel, cobble, rock, boulder) associated with the various fishing gear types used in New England and Mid-Atlantic fisheries # Explore options for the development of new otter trawl, scallop and clam dredge, and other fishing gear designs that have less contact and impact on the benthos than current fishing gear designs	HIGH HIGH HIGH HIGH HIGH Med.	NOAA, MAFMC, NEFMC	All MAFMC MAFMC NEFMC All All
	Effects on ecosystems as compared to other anthropogenic impacts and natural perturbations # Identify and establish baseline sites throughout the New England and Mid-Atlantic regions where fishing effort has been minimal	HIGH HIGH	Cooperative Research Funding	NEFMC MAFMC All
	Determine recovery rates for various habitat types	HIGH		All

Table 91- Essential Fish Habitat Research Needs (Identified by the EFH Steering Committee)

Research Category	Research Need	Priority	Potential Funding Source	Council/ ASMFC Interest
Gear Impacts (cont.)	Identify fishing grounds and SAV distributions to locate where the two overlap and identify the changes in beds over time	Med.		MAFMC ASMFC
	Effects of dredging for surf clams and ocean quahogs	Med.		NEFMC MAFMC
	Effects of ghost fishing gear	Low		MAFMC ASMFC
Specific Habitat Studies	Determine the functional value of various habitat types	HIGH		All
	# Distribution and value of relic shoal habitat along the mid-Atlantic coast	HIGH		MAFMC
	# Investigate the conditions and benthos that contribute to groundfish settlement and recruitment. Identify the areas where this happens with some regularity	HIGH		NEFMC MAFMC
	# Relationship between SAV and environmental quality of fish habitat and relative importance of SAV to other habitat types	Med.		All
	# Role of artificial fish habitats, both intentional and accidental, in the health of fishery species	Med.		All
	# Importance of "open sand bottoms" in shallow areas for various fish	Low		MAFMC ASMFC
	# Tagging/in situ observations to estimate habitat home range of species at critical life stages	Low		All
Data Collection Needs	Develop a reporting system and/or expand vessel tracking system to collect high resolution data on the distribution of fishing effort	HIGH	NMFS	All
Anthropogenic Impacts (non-fishing)	Effects on fish communities due to alterations to mud flat habitats	Med.		All
	Identify impediments to anadromous and catadromous fish passage on rivers and assess their impacts	Med.		All
	Effects of power plants on fish populations due to habitat change, entrainment and impingement	Low		All

Table 91 **(continued) Essential Fish Habitat Research Needs (Identified by the EFH Steering Committee)**

5.4.7 Identification of HAPCs

This review will take place during the next Habitat Omnibus Amendment scheduled to be completed in 2004. The process for considering new HAPC proposals is outlined in the Council's Habitat Annual Review and Report of 2000. This process will be followed during the next Omnibus Amendment.

5.4.8 Review and Revision of EFH Components of FMPs

The Council conducts a review of EFH designations at least once every five years, and this will take place during the upcoming Habitat Omnibus Amendment 2.

6.0 ENVIRONMENTAL CONSEQUENCES (IMPACTS) OF THE PROPOSED ACTION AND ALTERNATIVES

6.1 Introduction to Analysis of impacts

This section contains the analysis of impacts of the proposed action and alternatives, including no action, which are also summarized in Appendix I. Section 6.6 contains a discussion of the cumulative effects of the proposed action, compared to taking no action, and other past, present and reasonably foreseeable future actions, including other fishery and non-fishery actions that geographically overlap the monkfish fishery.

6.2 Biological Impacts

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission. The following sections (Sections 6.2.1- 6.2.3) contain a discussion of the biological impacts of the alternatives on monkfish, other managed fisheries, and protected species, respectively.

6.2.1 Biological Impacts of the proposed action

This section describes the impact of proposed action items in comparison to taking no action.

6.2.1.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries (see Section 4.1.1).

6.2.1.1.1 Incidental catch – 50 lbs. (tails) per day/150 lbs. maximum

Under the proposed action, vessels fishing with small mesh would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 150 lbs.. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

The proposed action will not have a biological impact on either monkfish or other species since there will not likely be any redirection of effort. The measure does not increase the incidental catch allowed on a one-day trip compared to the no action alternative, and, therefore, does not provide any incentive for vessels to target monkfish. Only certain small-mesh fisheries, namely squid and whiting, have vessels that engage in multi-day trips. These are high volume fisheries, and the allowance of 50 lbs. per day of monkfish is not a sufficient incentive for these vessels to target monkfish, but will simply allow for the conversion of discards to landings (minimize bycatch). By allowing vessels to land the incidentally caught monkfish, catch data will improve, allowing for better stock assessment and management. Furthermore, the incidental catch from all vessels not on a monkfish DAS is accounted for in the annual calculation of the trip limits and DAS allocated to the directed fishery.

6.2.1.1.2 Incidental catch -General Category scallop dredge and clam dredge

The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels.

For the same reasons given in the previous proposal, the Councils do not expect that the proposed action will have a biological impact on either monkfish or other species. The Councils do not expect that the allowed level of retention will result in any new effort on monkfish, but only that it will allow for the conversion of discards to landings.

6.2.1.1.3 Incidental catch - summer flounder vessels west of 72°30'W

The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island.

While there is limited evidence about discards of monkfish in this area during the past year when the current rule was in effect (the no action alternative), the proposed action restores the incidental limit that was in place under the original FMP. As a result, the Councils do not expect this action to have an impact on monkfish or other species in the area, except that it will allow for the conversion of some monkfish discards to landings in the fluke fishery. As with the previous two proposals, any incidental catch in this fishery will be accounted for in the annual calculation of trip limits and DAS allocated to the directed fishery, therefore no overall increase in effort is anticipated.

6.2.1.2 Minimum fish size

The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA, Section 4.1.2).

If the proposed action results in some vessels targeting smaller monkfish than under the no action alternative, the yield-per-recruit of monkfish could decline to a minor degree. The Councils do not expect that this 3-inch reduction in the tail size will cause such a redirection of effort. If, on the other hand, this change simply allows vessels to land monkfish that they otherwise were required to discard under the previous minimum size, then there would be no effect on yield per recruit. Allowing those vessels to land monkfish that otherwise would have to be discarded will also improve the catch data used in the stock assessment and management process.

6.2.1.3 Closed season or time out of the fishery

The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as multispecies (see Section 4.1.3).

The PDT and Industry Advisors commented that the no action alternative has no biological benefit because requiring vessels to take 20 days out of the fishery during a 90-day period, when vessels only have 40 DAS allocated is completely ineffective (they can still take their entire allocation during the same 90-day period), particularly when vessels not on a monkfish DAS can retain their incidental catch of monkfish. Therefore, eliminating the seasonal closure will not have an impact on monkfish or on other species.

6.2.1.4 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

The proposed action may cause a shift in effort from inshore areas to offshore, but with a reduction in overall effort resulting from the pro-rating of DAS compared to taking no action. If vessels enroll in the program that are not already active in the monkfish fishery, there could be some overall increase in fishing effort compared to no action, but the amount of new effort cannot be predicted. Overall, however, the Councils do not expect this to be a significant source of new effort, since the number of vessels that can participate in the fishery is limited by technical and logistical factors (for example, depth and distance from shore). Furthermore, any increases in overall effort resulting from the proposed action will be mitigated in subsequent years by automatic adjustments to the trip limits and DAS allocations under the stock rebuilding plan.

To the extent that vessels shift from inshore to offshore areas, the proposed action could have a positive effect on other fisheries, particularly multispecies. The catch of multispecies in the offshore fishery is insignificant, which is further minimized by the large-mesh requirement on vessels enrolled in this program. In addition, participating vessels with Category C and D permits who also hold multispecies permits will be using multispecies DAS when fishing in this offshore area, and, therefore, will have fewer mutispecies DAS available to target groundfish in other areas. Since the level of participation by such vessels in this proposed program is unknown, the magnitude of this impact cannot be predicted.

6.2.1.5 Modification of permit qualification for south of 38°N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

The analysis of this proposal indicates that five vessels would qualify for a permit under this proposal. These vessels fished for monkfish in the EEZ prior to 1999 when the FMP took effect. Subsequently, these vessels fished for monkfish either in state waters or in the EEZ under an experimental fishery permit. The experimental fishery was discontinued, and sea turtle closures further limited the ability of these vessels to fish for monkfish in the past two years. The proposed action, therefore, may result in some shift in effort from state waters to the EEZ, to the extent this activity is not constrained by the sea turtle closures. Furthermore, the proposed action could result in a modest increase in overall monkfish effort if these vessels are currently not active in the fishery. Overall, however, the biological impact on monkfish and other species is expected to be minimal due to the small number of affected vessels, the seasonal availability of monkfish in the area, the area restrictions of the proposed action (south of 38°20'N) and the sea turtle closures. Any increase in monkfish effort as a result of this proposal, however, would be mitigated in subsequent years by the automatic adjustment of trip limits and DAS allocations as needed by the stock rebuilding program.

6.2.1.6 Modifications to the framework adjustment procedure

The Councils propose three additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6). They are implementation of: 1) transferable monkfish only DAS (sale or lease); 2) measures to minimize fishery impact on protected species, including sea turtles; and 3) bycatch reduction devices.

Since the proposed action is strictly administrative at this point (enabling future regulatory action through the framework adjustment procedure) there are no direct biological impacts of the following three measures. If, and when the Councils propose to take action under the framework procedure, the impacts of specific measures would be analyzed and discussed in the accompanying environmental impact documents.

6.2.1.7 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7).

The proposed action will have no direct impact on domestic monkfish stocks, or other species, since it merely defines process for vessels to fish outside the EEZ while exempting them from domestic monkfish regulations. Although a similar exemption provision exists in the Multispecies FMP, and about 40 High Seas Compliance Permits have been issued, no vessel has undertaken to fish in the NAFO Regulated Area. It is unlikely in the reasonably foreseeable future that any monkfish vessels will make the trip. For that reason, the proposed action is not likely to have any biological impact.

6.2.1.8 Measures to minimize fishery impact on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8).

6.2.1.8.1 Southern Area trawl disc restriction

The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

This action has no immediate biological impact compared to taking no action, since vessels targeting monkfish in the SFMA already use gear that meets this requirement. The proposal will, however, limit monkfish vessels from expanding their effort into areas of complex bottom habitat, particularly offshore areas, and as a result has an indirect positive biological impact on monkfish and other managed species found in the SFMA. The magnitude of this impact cannot be determined, however, since it is primarily preventative and the amount of future potential effort that is affected is unknown.

6.2.1.8.2 Closure of Oceanographer and Lydonia Canyons to monkfish vessels

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals and their habitat.

As with the previous measure, this action has no immediate biological impact compared to taking no action, since vessels currently targeting monkfish in the SFMA are not fishing in the canyon areas that would be protected under this action. The proposal will, however, protect those areas that are known to have deep sea corals and sponges, among other species, from expanding monkfish fishing effort, particularly under the proposed offshore fishery program. Thus, the biological impact on monkfish and other managed species found in the canyons is preventative and, therefore, positive, but its magnitude cannot be determined, since the amount of future potential effort that is affected is unknown.

6.2.1.9 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research, and adopted both. Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined in Section 4.1.9.

The proposed cooperative research programs will not have a direct biological impact on monkfish or other species, since they are principally administrative in function. The pool of DAS is taken from existing allocations, and, therefore, does not result in a net increase in overall effort. Indirectly, the programs could have a positive biological impact, to the extent that the research undertaken under these programs results in reduced bycatch, minimizing fishery impacts on protected species or EFH, or improves the scientific understanding of monkfish biology and population dynamics.

6.2.1.10 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

This action is an administrative change that does not result in any increase in fishing effort or direct change to the fishery, and, therefore, has no biological impact.

6.2.1.11 Biological impact of no action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13).

6.2.1.11.1 Impact of DAS usage no action alternative

This alternative would continue the existing effort control program in the monkfish fishery. Category C and D permits also hold either a multispecies or scallop limited access permit, and when on a monkfish DAS must also use a multispecies or scallop DAS. Each vessel must weigh the opportunity cost of using a monkfish DAS to target monkfish against the value of using a scallop or multispecies DAS to target one of those fisheries. According to the data in Table 38, Category C and D vessels used less than 50 percent of the allocated monkfish DAS, and no scallop/monkfish DAS were used. Due to the linkage with those other FMPs, those effort control programs, which are as restrictive, or more restrictive than in the recent past, are likely to continue contributing to the monkfish rebuilding program in both management areas.

6.2.1.11.2 Impact of trawl minimum mesh size no action alternative

The current minimum trawl mesh size for vessels fishing on a monkfish-only or monkfish/scallop DAS is 10-inch square or 12-inch diamond codend mesh. This minimum mesh size, which is the largest mesh size required in all northeast fisheries, minimizes the bycatch of sublegal monkfish and non-target species. Since this mesh is only required on monkfish-only DAS, or monkfish/scallop DAS, and since nearly all monkfish trawl effort is on monkfish/multispecies DAS, the impact of no action is likely to be insignificant. If the Councils had decided to separate DAS usage requirements, this alternative would have had a greater impact, since more vessels would likely have operated under monkfish-only DAS.

6.2.1.11.3 Impact of the experimental fishery no action alternative

Under current regulations, vessels may conduct monkfish research under an Experimental Fishery Permit, as long as the vessels comply with the research and exempted fishing provisions of the Magnuson-Stevens Act. In fact, vessels are already conducting the specified research without formal establishment of an experimental fishery by the FMP. The no action alternative does not modify this ability, and, therefore, does not have a biological impact.

6.2.1.11.4 Impact of fishing year no action alternative

The alternatives under consideration to change the fishing year, including the no action alternative, are administrative and do not result in any biological impact.

6.2.2 Biological Impact of non-preferred alternatives

This section describes the impacts of alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. Since the impact of proposed measures is discussed in comparison to taking no action in the previous section, only those alternatives that contained measures other than the no action alternative are discussed in this section.

6.2.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered an alternative for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the alternative, Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. All monkfish limited access permit holders would initially be allocated 40 monkfish DAS but DAS could be reduced to meet rebuilding objectives.

The Councils considered two approaches (Decision 1a, Appendix I): separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b). The Councils also considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform ("fleet") allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery (Decision 1b in Appendix I). If the Councils had decided to adopt the de-coupled DAS program, they were also considering implementing transferable DAS either as a part of the Amendment 2 rule, or deferred to a future action under the framework adjustment process (Decision 1c, Appendix I). They were considering DAS transfer programs modeled after those in Multispecies Amendment 13, by lease or sale (Decision 1d, Appendix I).

In the DSEIS, the analysis of this alternative concluded that separating DAS usage requirements would provide for more control over the directed monkfish fishery, and that the associated trawl gear proposals (for vessels on a monkfish DAS) would reduce bycatch and discards, and increase yield-per-recruit, and minimize impacts on EFH. These effects could indirectly, and in a positive way, enhance the stock-rebuilding program. At the same time, the DSEIS noted that separating DAS usage requirements for Category C and D permits could result in increased directed fishing effort, compared to taking no action, as a result of monkfish DAS being "freed up". In other words, as the opportunity cost of using a monkfish DAS declines (that is, would not cost a vessel a multispecies or scallop DAS), vessels may elect to use more of their monkfish DAS than in the past. Simultaneously, multispecies Category C and D vessels, and to a far lesser extent scallop C and D vessels, could direct more of their effort on multispecies or scallops stocks, since they would have monkfish only DAS to target monkfish, and their "freed up" multispecies (or scallop) DAS to target multispecies (or scallops).

The degree to which individual vessels would actually avail themselves of this opportunity cannot be predicted, but if additional monkfish DAS are used, the DSEIS analysis suggested that the program established in Framework 2 provides for annual adjustment of trip limits to ensure that target catch levels designed to achieve annual biomass rebuilding goals are not exceeded. Under that program, the TAC for the directed fishery is calculated by subtracting the expected incidental catch from the overall TAC. The residual amount is then distributed among the DAS vessels under a formula that calculates the expected catch per DAS and DAS usage (by permit category) using the most recent full year for which landings data is available (that is, the previous fishing year). Thus, if either the catch per DAS or total DAS usage rates were to change significantly in any year (such as in response to the separation of DAS usage requirements), the current management program has an immediate and automatic response mechanism built in. This program functions as a backstop that protects the stock rebuilding program from sudden increases in monkfish effort. During the public comment period, however, the Councils recognized that effort levels could be unacceptably high during the two-year lag time in implementing these reactive adjustments (using previous year data to set following year TACs).

Also during the public comment period, the Framework 40a to the Multispecies FMP was implemented (see Section 2.9.2). This action created, among other things, a one-year Pilot Program for using B Regular DAS that potentially has an impact on the monkfish fishing effort. If the pilot program is successful, it will be a model for a future B Regular DAS management program that will enable multispecies vessels to target monkfish and healthy groundfish stocks, provided the quarterly TACs for the multispecies stocks of concern are not caught. Even though the total number of DAS on which multispecies vessels could target monkfish is less under this program, overall monkfish effort could increase under this program since vessels that did not direct on monkfish in past years could choose now choose to do so, since it is one of only a few stocks that would be available for targeting under a B DAS. The Councils, in response to public comment, were concerned that this program, combined with the potential effort increase under decoupled DAS usage requirements, could result in monkfish effort rising to unacceptable and unsustainable levels, jeopardizing the stock-rebuilding program.

Thus, while some biological benefits could have been realized with the adoption of separated DAS usage under this alternative, the overall negative impact of increased effort on monkfish stocks, as well as other managed stocks (multispecies and skates, in particular) outweighs any positive impact (see Skate Baseline Review, following below).

6.2.2.2 Skate Baseline Review

The Skate FMP identified and characterized a baseline of management measures in other fisheries that control the mortality of species in the Northeast skate complex. If the Council initiates an action in another FMP that changes one or more of the baseline measures such that the change is likely to have an effect on the overall mortality (discard and fishing mortality) for a species of skate in a formal rebuilding program, then the Skate FMP requires a baseline review.

A baseline review process is initiated if one or more of seven categories of management measures are changed which have been identified as providing beneficial protections for skates. The seven categories of management measures identified in the Skate FMP are: (i) NE Multispecies year-round closed areas, (ii) NE Multispecies DAS restrictions, (iii) Gillnet gear restrictions, (iv) Lobster restricted gear areas, (v) Gear restrictions for small mesh fisheries, (vi) Monkfish DAS restrictions for monkfish only permit holders, and (vii) Scallop DAS restrictions (See Section 4.1.6 of the Skate FMP for more details). Since Amendment 2 is considering decoupling Monkfish-Only DAS from Multispecies and Scallop DAS, overall allocated Monkfish-Only DAS may increase, although it is very difficult to predict whether actual effort will increase, decrease, or stay the same.

Since overall effort levels may increase, the Skate PDT must evaluate the potential impacts of this change over and above that which has been accounted for in the baseline before the Councils make final decisions on management measures for Amendment 2. In general, this section will evaluate whether decoupling DAS will have a greater impact on overall skate mortality as compared to the baseline and additional potential benefits may be afforded to skates from the other measures implemented by this action, as well as recently implemented actions under the Multispecies and Scallop FMPs (Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP).

A skate baseline review is only required for skate species that are currently in a formal rebuilding program. Of the seven skate species managed under the Northeast Skate Complex FMP, only two species are in a formal rebuilding program: thorny and barndoor. Therefore, this baseline review will evaluate the impacts of this Amendment on the mortality rates of these two species. Furthermore, the Skate FMP is very specific in identifying only seven categories of management measures that would trigger a baseline review. Therefore, while there may be other measures in this Amendment that could indirectly increase or decrease skate mortality, the baseline review is only required to assess whether the proposed action would implement a change to one or more of the seven identified measures.

DAS is one of the primary mechanisms used for controlling effort and reducing fishing mortality in the monkfish fishery. Monitoring monkfish effort is complicated because the program currently has four permit categories (A, B, C and D) and two of those categories, C and D, are linked to DAS allocations in other fisheries. All four vessel categories have been awarded 40 "Monkfish-Only" DAS, but Category C and D monkfish vessels are charged a Multispecies or Scallop DAS each day that vessel targets monkfish. Therefore, if a Category C or D vessel decides to target monkfish, they are charged one Monkfish-Only DAS and one Multispecies or Scallop DAS for every day that vessel is at sea. On the other hand, Category A and B monkfish vessels are vessels that qualified for a monkfish limited access permit, but did not have a multispecies or scallop permit; therefore, they have been allocated 40 Monkfish-Only DAS. The only difference between Category A and B is that one category has a higher possession limit.

If DAS are decoupled, then vessels with Category C or D permits may direct on monkfish without being charged a Multispecies or Scallop DAS. This may result in an increased use of allocated Monkfish-Only DAS. The overall impact to skate mortality is difficult to evaluate when you consider the alterations to DAS programs under recent amendments to the Multispecies and Scallop FMPs. Both Amendment 13 to the Multispecies FMP and Amendment 10 to the Scallop FMP have altered the total allocated DAS, and in both cases, DAS usage is more restrictive. For example, the conditions of DAS use in exchange for participation in special area access programs. These changes to DAS programs took place after implementation of the Skate FMP and baseline assessment of DAS. Therefore, it is appropriate to consider whether these changes in DAS use effectuate positive controls on skate mortality in light of the alternative under consideration in Amendment 2 that would decouple DAS.

Multispecies DAS
The Skate FMP's baseline of management measures with respect to groundfish DAS was established according to the effort level prescribed in the interim action (about 62,000 DAS available to the entire fleet). Amendment 13 to the Multispecies FMP categorized DAS into A, B (regular and reserve), and C DAS. This change in designating DAS into several different categories is an important shift in management, especially when you consider the restrictions on their use. For example, Amendment 13 allocated about 43,000 Category A DAS, which are DAS that can be fished anywhere in open areas. Amendment 13 also allocated a specific number of Category B DAS that can only be used to target healthy stocks through programs like special access programs (SAPs). Amendment 13 allocated about 14,500 Category B regular and about 14,500 Category B reserve DAS. Amendment 13 also allocated Category C DAS, which do not represent actual effort because these DAS were established according to the level of latent effort that existed during the qualifying time frame; therefore, they are unavailable for use at this time.

The Council recently approved Framework 40a to the Multispecies FMP, which implements several Special Access Programs (SAPs), and allows for the use of category B DAS in these SAPs. A skate baseline assessment was completed for that action in Section 8.1.3 of Framework 40a and the Skate PDT concluded that there will not be overall negative impacts on skate mortality as a result of the SAPs proposed in this action. Even though effort may increase as compared to Amendment 13 allocations, and portions of the mortality closed areas will be opened to limited fishing effort, the overall DAS allocated to the fleet is still significantly lower than allocated DAS evaluated in the Skate FMP baseline. Overall, the impacts of Framework 40a on skate mortality are expected to be minimal.

Scallop DAS
The baseline of scallop effort described in the Skate FMP is 34,000 DAS, and is based on the total number of allocated DAS from the fishing years 1999-2002. Since implementation of the Skate FMP, scallop management has evolved to a rotational area management scheme. In particular, Amendment 10 recently (June 2004) implemented a rotational area management strategy, which allocates a certain number of DAS to vessels for use inside specific rotational access areas, and a separate number of DAS that can be used outside identified access areas. Prior to Amendment 10, allocated DAS could be used in any area- fishermen were not given the opportunity to use days in certain areas in exchange for a DAS tradeoff (i.e., some portion of the used DAS is credited back to them). Furthermore, Amendment 10 implements additional restrictions associated with DAS use in the scallop access areas, such as gear requirements (e.g., minimum twine top mesh size), scallop possession limits, broken trip provisions, and trip allocations/DAS tradeoffs, which further limit harvest levels and may reduce the levels of skate bycatch that would normally be encountered in the scallop fishery.

On the heels of Amendment 10, the Council approved a joint Multispecies/Scallop framework action (Framework 16/39). Although it has not yet been implemented, it would provide controlled access into portions of the groundfish closed areas. A complete skate baseline review was prepared for that action (See Section 7.1.4 of Framework 16/39 for details). Framework 16/39 proposes that full-time limited access vessels receive 42

DAS to fish anywhere in open areas, 48 DAS for fishing exclusively in the Hudson Canyon Area, and 36 DAS for access to designated areas within the groundfish mortality closed areas during the 2004 fishing year. These three DAS allocations for full-time vessels totals 126 DAS, six more days than the 120 DAS assessed in the Skate FMP baseline. However, if they choose not to participate in one or more of the access areas, then they forfeit that entire amount of DAS, which would not be available to use in other areas, as would have been the case under previous scallop actions.

When you break down the DAS allocations according to permit category and compare these to the baseline in the Skate FMP, the FY2004 allocations are slightly higher for two of the three limited access vessel categories: 6 more DAS for full time vessels, 2 more DAS for part time, and the same DAS allocation for occasional vessels. After FY2004, the DAS allocations are reduced to levels significantly below the Skate FMP baseline (i.e., 34,000 DAS available for use by all limited access permit categories). In FY2005, the DAS allocated to the limited access fleet would be 100 DAS for each full-time vessel, (20 DAS less per vessel than the Skate FMP baseline), 40 DAS for each part-time vessel (10 DAS less per vessel than the Skate FMP baseline), and 8 DAS for each occasional vessel (2 DAS less per vessel than the Skate FMP baseline).

After implementation of Amendment 10 and Framework 16/39, total allocated DAS are expected to increase to approximately 35,800 DAS in 2004; however, in the long term total allocated DAS is expected to be around 27,000 DAS under rotational area management. The projected amount of DAS used remains significantly below the level used in the baseline 2002 fishing year (about 30,065 DAS). Therefore, while total allocated Scallop DAS is expected to increase slightly above the baseline in 2004, allocated DAS will decrease after the first year of the program. In addition, due to the new stipulations on DAS in Amendment 10 and Framework 16/39, DAS use is more restricted compared with the scallop effort that was attributed to controlling skate mortality under the Skate FMP baseline.

Monkfish Only DAS

There is overlap between the monkfish and skate fisheries, and monkfish vessels often land some skates that they catch incidentally while monkfish fishing (mostly skate wings as opposed to skate sold for bait). The Skate FMP baseline related to monkfish effort is 4,500 Monkfish-Only DAS (including permit categories C and D). This value is based on the approximate 4,240 Monkfish-Only DAS that were allocated in 2002. Approximately 2,100 of those DAS were from Category A and B vessels, and the remaining DAS were additional Monkfish-Only DAS that were awarded to multispecies vessels under the groundfish interim action implemented as a result of CLF v. Daley (Framework 33 lawsuit). That ruling allowed groundfish vessels that were allocated fewer than 40 Multispecies DAS to fish the remainder as Monkfish-Only DAS. As a result, approximately 2,200 DAS were shifted from coupled Multispecies/Monkfish DAS to Monkfish-Only DAS.

Decoupling DAS under Amendment 2

If DAS are decoupled in this Amendment, overall available Monkfish-Only DAS may increase and use of these DAS will be dependent on how profitable (catch per unit effort) it will be to fish for monkfish exclusively. Due to the nuances between the various permit categories and how monkfish effort is coupled with other management plans, in order to assess the overall impact of decoupling DAS on skate mortality, the changes in Multispecies, Scallop and Monkfish DAS must be considered. Table 92 compares the allocated DAS in each fishery used in the skate baseline versus the maximum allocated DAS under present management programs if Monkfish DAS are decoupled from Scallop and Multispecies DAS. The Skate FMP identifies the baseline of Multispecies DAS to be 62,000 DAS. After implementation of Amendment 13 the total Category A DAS available to the multispecies fleet is approximately 43,000, with another approximately 14,500 B-regular DAS and 14,500 B-reserve DAS (for a total of 72,000 DAS) available to the fleet. Category C DAS are not considered because these DAS allocations are not based on actual effort and cannot be used at this time. Multispecies A and B DAS are not the same and should not be combined to evaluate the total amount of allocated effort because B DAS are more restrictive in terms of how and where they can be used.

The Monkfish Amendment 2 skate baseline evaluation simply recognizes that if DAS are decoupled, there would be more Multispecies and Scallop DAS available to vessels with C and D monkfish permits, because there would no longer be a need to use a Scallop or Multispecies DAS when targeting monkfish under a Monkfish-Only DAS. However, it should be noted that if DAS are decoupled in this Amendment, vessels will still have the option to keep their DAS coupled on a trip-by-trip basis. It should also be noted that according to Table 38, all of the Monkfish Category C and D vessels that used a Monkfish-Only DAS to target monkfish, were called in by multispecies permit owners, not scallop permit owners. However, only about 40-50% of the total DAS for Multispecies vessels with monkfish Category C or D permits were used in FY2001 and FY2002.

The Skate FMP baseline related to scallop fishing effort is 34,000 DAS available for use by all limited access permit categories. After implementation of Amendment 10 and in the future, Framework 16/39, the total DAS available to the scallop fleet is projected to be approximately 35,000 DAS, a net increase above the baseline described in the Skate FMP. Similar to Multispecies DAS, a Scallop DAS is more restrictive after implementation of Amendment 10 than a DAS assessed under the skate baseline. The limited access scallop fleet will now be charged a minimum amount of DAS to enter into scallop access areas, with various other restrictions, including possession limits and gear requirements. Therefore, the DAS are not completely comparable pre- and post-Amendment 10, for purposes of evaluating changes to the Skate FMP baseline. Furthermore, the total Scallop DAS allocations are expected to decrease to a level around 27,000 DAS a year after implementing the rotational area management program, which is about 6,000 total DAS lower than the Skate FMP baseline.

The Skate FMP identifies the baseline of Monkfish-Only DAS to be 4,500 DAS (about 2,200 DAS for Category A and B vessels, and the rest for multispeices vessels that did not receive 40 DAS in 2001). Under the preferred alternative, this Amendment proposes to decouple Monkfish DAS from Multispecies/Scallop DAS, and to allocate 40 DAS to all limited access monkfish vessels. Under this scenario, the total maximum DAS that would be available today to direct on monkfish for Category A and B vessels is 2,200 (based on 15 Category A vessels and 40 Category B vessels). In addition, approximately 26,520 additional Monkfish-Only DAS would potentially be available for Category C and

D vessels (based on 328 Category C vessels and 335 Category D vessels). It is not likely that all Multispecies and Scallop vessels that are allocated Monkfish-Only DAS will choose to target monkfish. In fact, according to Table 92, no scallop vessels with Category C or D permits landed monkfish on a Monkfish-Only DAS in 2002, and about 40-50% of the Monkfish-Only DAS allocated to multispecies vessels were used. Whether or not these trends would continue under the preferred Amendment 2 decoupling alternative, depends on the areas where vessels would chose to fish, if they had the option to do so, and if it would be cost effective to target monkfish under the applicable trip limits. However, if DAS are decoupled, Category A, B, C, and D monkfish vessels are expected to be allocated approximately 28,720 Monkfish-Only DAS (600 DAS for Category A vessels, 1,600 for Category B vessels, 13,120 for Category C vessels, and 13,400 for Category D vessels).

Conclusion
Although the potential impacts of decoupling DAS according to the preferred alternative in this amendment appears to increase effort beyond that considered in the Skate FMP baseline, vessels will still have the option to keep their DAS coupled on a trip-by-trip basis. While the number of DAS available seems to be very high as compared to the DAS assessed under the Skate FMP baseline, these estimates are maximum values, and there are many unknowns that make this evaluation uncertain. For example, it is impossible to predict how many allocated Monkfish-Only DAS under the preferred decoupling alternative will be used to target monkfish exclusively. Furthermore, it is unknown where this effort will be used. While in fact, some non-preferred alternatives describe an area-based decoupling scheme; it is unclear whether or not this would translate into more or less impacts on skate mortality. If more effort shifts to the south, then impacts on thorny and barndoor skate mortality would be reduced, but if effort shifts to the north, it is possible that there would be greater impacts on thorny and barndoor skate mortality.

In addition to the overall preferred alternative to decouple DAS in this action, there are several alternatives under consideration that would implement decoupling DAS differently, for example, by area, transferability, and leasing of DAS. Depending on which alternatives are selected, the various options could have different impacts on skate mortality. For example, DAS Alternative 1A would only allow decoupled DAS to be used in the southern fishery management area. If effort increased as a result of decoupling DAS, it would only impact skate species that are found in the south. Of the two species included in the skate baseline assessment only part of the barndoor distribution is found in the SFMA. Thorny skates are primarily found in the Gulf of Maine, thus a potential increase of effort in the SFMA would not impact thorny skate mortality. On the other hand, DAS Alternative 1b would allow decoupled DAS to be used in both areas; therefore if effort increases in the north as a result of decoupling DAS, then both species could be impacted. In terms of transferability, Transferable DAS Alternative 2 and 3 could result in the activation of latent effort. While there is potential for effort to increase as a result of activation of latent effort, direct impacts on skate mortality are uncertain.

If DAS are decoupled, and the Councils require specific gear to be used on directed monkfish trips, preliminary research shows that the proposed monkfish trawl gear may be effective at reducing skate bycatch. This gear requirement could be considered a mitigating measure to offset the potential increase in skate mortality as a result of the increase in allocated DAS available to target monkfish. (In order to fully evaluate the effectiveness of this gear for avoiding skate bycatch the research results from this experiment would need to be peer reviewed and fostered through the management process, e.g., Research Steering Committee). Overall, this measure is expected to have fairly low impacts to skate mortality as compared to that which was assessed under the Skate FMP baseline, particularly because of the gear selectivity measure. Furthermore, both the Multispecies and Scallop fisheries have made adjustments to their DAS programs, and the added restrictions on DAS use are expected to result in fewer impacts on skate mortality overall, especially when you consider these changes in DAS use relative to the effort controlling measures in effect at the time the Skate FMP implemented its baseline.

	Under Skate Baseline	**2004**	**2005**	**2006 and beyond**
Multispecies DAS	62,000	A DAS 43,000	A DAS 43,000	A DAS 39,600
		B DAS 29,000	B DAS 29,000	B DAS 32,400
		Total 72,000	Total 72,000	Total 72,000
Scallop DAS	34,000	35,000	27,800	25,300
Monkfish-Only DAS	4,500	IF DAS ARE DECOUPLED Assuming 718 total Monkfish Permits (A, B, C, and D)		
		29,000 (718 X 40 DAS)	29,000	29,000
Total DAS Available	100,500	136,000	128,800	126,300

Table 92 – Allocated Multispecies, Scallop and Monkfish-Only DAS under the Skate FMP baseline as compared to maximum allocated DAS under present management programs if Monkfish-Only DAS are decoupled.
Note: These DAS are allocated DAS, not necessarily the expected usage. For the scallop and multispecies fisheries usage is affected by the conditions of participation in area access programs.

6.2.2.3 Alternatives to the 50 lbs./trip incidental catch limit

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs.

The DSEIS analysis concluded that the proposed adjustments to the incidental catch limit, including this non-preferred alternative, will not affect fishing effort on monkfish and the stock-rebuilding program. One of the fundamental elements of the management plan is that the directed fishery TAC is calculated after accounting for the incidental catch of monkfish in other fisheries. Thus, if monkfish catches increase as a result of any adjustment to the incidental catch limit, the amount of the overall TAC available to the directed fishery will be reduced proportionally. Nevertheless, the proposed adjustments are not expected to result in increased catches of monkfish in those non-directed fisheries affected by the proposed changes. Those increases will convert some discards to landings, especially as monkfish stocks increase, resulting in better catch data, but they are not large enough to create a directed fishery under a nominal incidental catch fishery. Thus, this alternative would not likely have a significant biological impact compared to no action.

6.2.2.4 Minimum trawl mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). That would be 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net under Alternative 2, and 12-inch square mesh in the codend under Alternative 3. If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

For mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

According to the analysis in the DSEIS, supported by public comment, in the case of monkfish, the selectivity characteristics of 10-inch or larger trawl and gillnet mesh are not well understood, but generally the fishery already uses (by both fishermen's choice and regulation) the largest meshes of any fishery in the region. Alternatives that increase minimum mesh size are likely to result in some increase in yield-per-recruit for monkfish, but these effects cannot be quantified. Also, qualitatively speaking, larger mesh sizes also reduce the incidental catch of other species, but the actual difference between no action (10-inch square mesh on trawl vessels) and the non-preferred alternatives (12-inch square mesh) is not likely to be significant since most of the incidental catch is already released under the current mesh size, according to public comment.

6.2.2.5 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 10-inch minimum tail size (Alternative 2, Option 2), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch.

The DSEIS noted that decreasing or eliminating the minimum fish size could have a negative effect on yield-per-recruit, but would not likely have a significant effect on the monkfish stock rebuilding program which is based on trip limits and DAS. The DSEIS pointed out, however, that alternatives that reduce or eliminate the minimum fish size do not necessarily translate into reduced yield-per-recruit if those fish that could be landed under the new rule were simply fish that otherwise would be caught and discarded. According to the analysis of bycatch in that document, the primary reason given to observers for monkfish discards in directed fisheries is "too small" either due to regulation or market cull, and, therefore, those measures are not likely to have a significant effect on reducing yield per recruit since they would likely simply convert discards to landings. If directed effort shifts to targeting smaller fish in response to the reduced or eliminated minimum size, however, there could be negative impacts on stock rebuilding (more numbers of fish killed for a given TAC).

6.2.2.6 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (2 20-day blocks).

The Councils considered PDT comments in the DSEIS that a 20-day block over a 90-day period, when vessels are only allocated 40 DAS, is totally ineffective. Furthermore, even if the period were extended to 40 days, the benefits to spawning, which are the basis for the closed season, are unknown, and the effectiveness of the longer closed season is reduced by the fact that vessels in other fisheries could still land monkfish under the various incidental catch limits during the period when vessels are not active in the directed fishery.

6.2.2.7 Offshore SFMA Fishery

The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but rejected options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

Area Option 2 differs from the proposed action by restricting the offshore fishery program from fishing along the southern flank of Georges Bank. This alternative, however, has no significant biological impact compared to proposed action, since vessels not enrolled in the program can target monkfish in that zone. In fact, since those vessels could fish with multispecies regulated mesh when on a multispecies/monkfish DAS, Option 2 could have a greater impact on regulated species and small monkfish than the proposed Option 1, under which those vessels would be required to use 10-inch mesh in that area if they are enrolled in the offshore program.

Since both DAS/Trip Limits options represent different methods for calculating the trip limits and DAS allocated to participating vessels, based on the same overall annual allocation, the two options are equivalent from a biological perspective.

6.2.2.8 Modification of permit qualification for south of 38°00'N

The Councils took to public hearings four alternatives that would revise the limited entry qualification periods for certain vessels that did not qualify for a permit under the original FMP, plus no action. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°00'N.

	Qualification period – four years prior to:	
Alternative 1	June 15, 1998	(full year)
Alternative 2	June 15, 1997	(full year)
Alternative 3	June 15, 1998	(March 15 – June 15)
Alternative 4	June 15, 1997	(March 15 – June 15)
Alternative 5 (no action)	February 27, 1995	

Table 93 Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

The biological impact of the non-preferred Alternatives 1, 2 and 4 are not significantly different than Alternative 3, compared to no action. The basis for this conclusion is that the number of affected vessels ranges from 3 to 7, with 5 expected to qualify under the proposed action, Alternative 3. As noted in the discussion of impacts of Alternative 3, the proposed action may result in some shift in effort from state waters to the EEZ, to the extent this activity is not constrained by the sea turtle closures. Furthermore, the proposed action could result in a modest increase in overall monkfish effort if these vessels are currently not active in the fishery. Overall, however, the biological impact on monkfish and other species is expected to be minimal due to the small number of affected vessels, the seasonal availability of monkfish in the area, the area restrictions of the proposed action (south of 38°20'N) and the sea turtle closures. Any increase in monkfish effort as a result of this proposal, however, would be mitigated in subsequent years by the automatic adjustment of trip limits and DAS allocations as needed by the stock rebuilding program.

6.2.2.9 EFH Alternative 4 Option 2 (Monkfish trawl configuration)

The Councils considered an alternative trawl configuration specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated. The Councils considered adopting individual elements from the following options, and sought public comment on the specific components. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and reduce the likelihood that they will be used in hard bottom areas that provide EFH for other groundfish species.

The Councils considered this alternative trawl configuration as a means to minimizing the impact of the directed monkfish fishery on EFH of other species, particularly groundfish, and to reducing incidental catch of small monkfish, multispecies and skates. However, the gear is unproven, and based on public comment, may not be any more effective in keeping effort off complex bottom areas than the 10-inch minimum mesh size and the 6-inch roller restriction in the southern area, since groundfish catches are likely to be minimal. The impact of this gear, while potentially beneficial to monkfish and other managed species, is highly uncertain, and may be no more effective than the no action alternative (10-inch square mesh) if DAS are not separated, since the number of vessels that would be required to use it (i.e. trawl vessels on a monkfish only DAS) is minimal.

6.2.2.10 EFH Alternative 5C (up to 12 large, steep-walled canyons closures)

The Councils considered two closure options to minimize the impacts of the directed monkfish fishery on deepwater corals and adopted Alternative 5AB. Non-preferred Alternative 5C proposed to close waters above up to 12 large canyons from Norfolk Canyon to the Hague Line.

As with proposed action (EFH Alternative 5AB, closure of Oceanographer and Lydonia Canyons), this alternative has no immediate biological impact compared to taking no action, since vessels currently targeting monkfish in the SFMA are not fishing in the canyon areas that would be protected under this action. This alternative would, however, protect those areas that are known to have deep sea corals and sponges, among other species, from expanding monkfish fishing effort, particularly under the proposed offshore fishery program. Thus, the biological impact on monkfish and other managed species found in the canyons is preventative and, therefore, positive, but cannot be quantified, since the amount of future potential effort that is affected, as well as the number and distribution of affected species (fish as well as corals and sponges) in these areas is unknown.

6.2.2.11 NFMA Monkfish trawl experimental fishery

The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS.

The proposed experimental fishery would not have a direct biological impact on either monkfish or other managed species, compared to no action, since vessels can conduct such experimental fisheries without the Councils adopting this alternative, and, in fact, such an experiment is currently being done. The DSEIS noted, however, that indirectly the trawl experimental fishery could reduce the monkfish fishery's impact on the multispecies fishery, if successful and followed-up with establishment of a trawl exempted fishery. The goal of the experiment is to determine if and under what circumstances a monkfish trawl exempted fishery can be established that meets the maximum bycatch tolerance of the multispecies regulations. If successful, the fishery will provide an alternative fishery for multispecies vessels facing increasing restrictions under Amendment 13, with minimal incidental catch of groundfish. Since an experimental fishery is already being conducted, these benefits could be realized without the Councils taking further action.

6.2.2.12 Change fishing year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) considered but rejected three alternatives for changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively. Alternative 1 is the no action alternative.

This is an administrative action and, therefore, these alternatives do not have any biological impact compared to taking no action.

6.2.2.13 DAS prorating alternatives if the fishing year is changed

Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The Councils considered two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment. Since the Councils took no action to change the fishing year, these administrative alternatives are irrelevant.

6.2.3 Impacts on Marine Mammals and Protected Species

6.2.3.1 General Considerations

Background information on the fishery relative to interactions with threatened and endangered species is included below to lend context to the discussion on impacts of the management alternatives under consideration in Section 6.2.3.2. It is excerpted from the Biological Opinion dated April 14, 2003 and prepared by NOAA Fisheries, Northeast Region. While a number of the species discussed have no known takes in the directed monkfish fishery, many have either had documented takes in multispecies sink gillnet gear which is used in the monkfish fishery or their distribution is known to overlap with the fishery. For example, in the case of sei whales, takes in fishing gear have not been documented and their distribution is generally offshore, but Waring et al. (2002) reports that reduced prey availability in certain years has resulted in more inshore movements of this species in locations such as Great South Channel and Stellwagen Bank. The following discussion, therefore, is based on potential risks based on the overlap of the monkfish fishery and the distribution of the species, or takes in gear that is consistent with that used in the directed monkfish fishery.

> *The location of the monkfish fishery in relation to the distribution of ESA-listed species is a factor influencing the likelihood that a gear entanglement will occur. All of the species considered in this Opinion occur in the action area where monkfish gillnet gear is set. Overlap of monkfish gillnet gear with right and humpback whales occurs during the fall and spring when right and humpback whales travel between northern foraging grounds and southern calving areas as well as when these species are on the foraging grounds in the Gulf of Maine.*

Overlap of the fishery with humpback whales can also occur in the winter off of Virginia where juvenile humpback whales have been observed feeding.

Fin whales are more ubiquitous in their distribution, and less is known about their winter distribution than for right and humpback whales. In the North Atlantic, the single most important area for this species appears to be from Great South Channel, along the 50m isobath past Cape Cod, over Stellwagen Bank, and past Cape Ann to Jeffrey's Ledge (Hain et al. 1992).

Within the action area, the sei whale is most common on Georges Bank and into the Gulf of Maine/Bay of Fundy region during spring and summer, primarily in deeper waters. Individuals may range as far south as North Carolina. Blue whales are still considered to occur more regularly in Canadian waters as compared to U.S. waters, but blue whales have been observed in the Gulf of Maine including three sightings in the summer and early fall 2002. In the U.S. EEZ, sperm whales are distributed in a distinct seasonal cycle; concentrated east-northeast of Cape Hatteras in winter and shifting northward in spring when whales are found throughout the Mid-Atlantic Bight. Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 1999). Given the distribution of these species, all occur in areas where monkfish gillnet gear is set, although blue whales and sperm whales are expected to have the least extent of overlap with monkfish gillnet gear given the depths at which these species typically occur.

Sea turtles also occur through all or most of the area in which monkfish gillnet gear is set. Of the turtle species considered, loggerheads are the most abundant in the action area. Loggerhead turtle abundance is relatively high from Cape Hatteras to Long Island throughout continental shelf waters (NOAA Fisheries 1994). Loggerhead, green and Kemp's ridley turtles are also sighted in inshore waters of the Mid-Atlantic area (NOAA Fisheries 1994).

While leatherbacks are most often sighted offshore, they may follow jellyfish into nearshore waters (NOAA Fisheries 1994). Turtles occurring in the inshore waters of Virginia tend to stay from May through November, and turtles generally occur in New York inshore waters from June until October (NOAA Fisheries 1994). Coincidentally, peak monkfish landings by gillnet gear occur in the SFMA in May-June and November-December (Monkfish SAFE Report 2001). Of particular concern is the early spring monkfish gillnet fishery that occurs off of North Carolina and Virginia in March through May. It has been previously shown that the narrowness of the continental shelf and the influence of the Gulf Stream on nearshore regions serves to concentrate sea turtles emigrating from nearshore waters in the Mid-Atlantic Bight and Pamlico and Core Sounds in the late fall and early winter (Epperly et al. 1995b). As water temperatures warm in the spring, these turtles begin to move north and disperse to summer foraging grounds. Although monkfish fishing effort in EEZ waters off of North Carolina and Virginia is far less than elsewhere in the action area, the high concentration *of turtles in the area means there is a risk of a high level of interaction with the fishery.*

As described above, monkfish trawl gear is used more often in New England waters and in deeper waters throughout the action area where sea turtles are less likely to occur. Therefore, the risk of entanglement for sea turtles in this gear type is expected to be less than for gillnet gear. However, based on take of sea turtles in trawl gear used in other fisheries, sea turtle takes in monkfish gear are possible when the distribution of sea turtles and operation of this gear in the monkfish fishery overlap.

Another factor influencing the likelihood that a gear entanglement will occur is the configuration of the fishing gear. Baleen whales, including right, humpback, fin, sei and blue whales, skim and gulp for prey and filter vast quantities of water through rows of baleen plates suspended from the upper jaw on the inside of their large mouths. Line suspended in the water column such as from buoy lines may become caught in the baleen if the whale incidentally encounters the line when feeding. Whales may also be more likely to become incidentally entangled in gillnets when distracted by feeding or social behavior.

Leatherback sea turtles may actually be attracted to buoys used on trawl and gillnet gear which could appear to be jellyfish, or they may be attracted to the organisms which colonize ropes and buoys. Tie-downs used on monkfish gillnet gear in the Mid-Atlantic may also contribute to sea turtle entanglements in such gear. While tie-downs reduce the vertical profile of the net which can help to reduce interactions with harbor porpoise, the tie-down also creates a pocket of netting which can increase the likelihood of entanglement for species that occur at or near the bottom. Using tie-downs is a common practice in portions of the monkfish fishery in order to increase the catch rate of monkfish (a bottom dwelling fish species). Given that hard-shelled sea turtles such as loggerheads, greens, and Kemp's ridleys forage at or near the bottom in benthic habitats, the use of tie-downs for gillnets set in the same areas may increase the likelihood that turtles will be caught in the net. The long soak time of monkfish gillnets, particularly in the Mid-Atlantic, also increases the risk of sea turtle entanglements by increasing the length of time (i.e., the opportunity for incidental capture) that the net is in the water. Soak times for monkfish gillnets, in general, are greater than the submergence tolerance of sea turtles. Therefore, sea turtles are almost certainly expected to die as a result of capture in a monkfish gillnet unless the animal is caught in the net close to the surface and has the ability to breathe, or is caught immediately prior to hauling of the net.

While the implications of potential shifts, as well as increases and decreases in fishing effort, are discussed in detail below, in Section 6.2.3.2, the overall impacts of the amendment remain unclear at this writing. In a number of cases they are dependent on the behavior of fishermen responding to actions proposed for the Northeast multispecies and sea scallop fisheries. It is known, however, that right, fin, humpback, fin and sei whales and loggerhead, green, Kemp's ridley and leatherback turtles become entangled in both trawl and sink gillnet gear that is identical or similar to that used in the monkfish fishery.

Although they could occur, the April 2003 NMFS Biological Opinion prepared for the monkfish fishery notes that there have been no reported or observed incidental takes of sea turtles specifically in the monkfish otter trawl fishery during any time of the year. Similarly, ESA-listed whales are rarely caught in trawl gear.

Sea turtles, however, occur throughout the area in which monkfish gillnet gear is set, but particularly in the SFMA. Takes of turtles that have been attributed to monkfish gear are expected to be reduced by the Large–Mesh Gillnet Final Rule in effect for federal waters off North Carolina and north to Chincoteague by limiting effort to times when sea turtles are not expected to be present in large or significant numbers.

Loggerhead turtles are most affected by potential increases in gillnet effort and benefit from the Large Mesh Final Rule, although green and Kemp's ridley turtles are also found inshore in the Mid-Atlantic area. Right and humpback whales may also experience reduced risks of entanglement as a result of the turtle measures.

Other actions affecting sink gillnet gear include the Harbor Porpoise Take Reduction Plan which prohibits setting gillnets in southern Mid-Atlantic waters for selected time periods. The plan should benefit any cetacean moving from southern nursery areas to northern feeding areas during these periods as well as sea turtles that are present in the areas during the closure period. Rules included in the Atlantic Large Whale Take Reduction Plan require modifications to gillnet gear to reduce the risk of entanglement as well as the severity of entanglements for large whales.

6.2.3.2 Impacts of Amendment 2 Measures on Protected and Endangered Species

This section contains analysis and discussion of proposed measures as well as those considered in the DSEIS but not adopted by the Councils. Proposed and non-preferred alternatives are identified within each subsection.

6.2.3.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered two alternatives for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. The Councils did not adopt these alternatives.

Under both alternatives (Alternative 1a and 1b) and under the no action alternative (Alternative 2), all monkfish limited access permit holders would be allocated 40 monkfish DAS. Options are also provided under Alternative 1 that would allocate individual DAS based on past performance in the monkfish fishery. DAS could be reduced, under the management program implemented in Framework 2, if the SFMA TAC is set below 8,000 mt. In that case, the trip limits would remain fixed at 550 lbs. and 450 lbs. (tails/DAS) for Category A and C, and B and D, respectively.

The two alternatives for de-coupling monkfish DAS from multispecies and scallop DAS usage requirements would allow vessels the choice, both annually and on a trip-by-trip basis, to use separated DAS or combined DAS. Whether or not a vessel would fish its monkfish DAS separately depends on the particular circumstances of the vessel, namely, area and gear fished, number of DAS or opportunities available in other fisheries, and possibly other considerations.

The combined, or cumulative effect of de-coupling DAS usage requirements and the B Day measures adopted in the Multispecies FMP would be a far greater increase in monkfish effort than under the proposed, no action alternative. This would occur to a large degree in the NFMA, where the availability of alternative fisheries to those impacting the groundfish species of concern is more limited. Vessels that could have, but did not target monkfish in the past, would now target monkfish on their B days, as well as on their de-coupled monkfish DAS, had that alternative been adopted.

The requirement to use a specific net (proposed monkfish trawl or large-mesh gillnet) while on a monkfish DAS is an additional factor that each vessel owner would have to consider in making the decision whether to de-couple DAS, had this alternative been adopted. Protected species interactions would likely not change from current levels under this scenario. It should be noted that until a monkfish trawl exempted fishery is established in the NFMA (following experimental fishing shown to minimize bycatch of regulated species to below the 5 percent standard), trawl vessels must be on a multispecies DAS to land more than the incidental catch limit, therefore, in the near term the option to increase effort by separating DAS in the NFMA does not exist for trawl vessels, although effort may increase as a result of the Multispecies B day program.

In the SFMA, where vessels can direct effort on monkfish and multispecies with far less overlap than in the NFMA, Category C and D could increase overall effort under DAS Alternative 1 compared to no action because they would have monkfish DAS *in addition* to their multispecies or scallop DAS, not *in combination with* their other DAS. If effort increases, there could be negative effect on protected species due to the increased possibility of encounter. Under Multispecies Amendment 13, groundfishing effort has been substantially reduced, although the B day program adopted in Framework 40A may result in monkfish fishing effort actually increasing, although the total change in effort due to the combination of DAS alternatives in this amendment and changes in Amendment 13 and Framework Adjustment 40a cannot be quantified at this time.

While the number of vessels that would use the opportunity presented by Alternative 1 cannot be determined, it is most likely that some scallop vessels will increase overall fishing time if DAS are decoupled. Under Alternative 1, those vessels could fish their entire scallop allocation on a full-time basis and then fish their monkfish DAS allocation. Under this alternative the potential for interactions with protected species in the SFMA is likely to increase compared to no action. One limiting factor is that vessels will have to weigh the opportunity costs and the cost of re-rigging to use the monkfish trawl against the expected revenues.

If a significant number of scallop vessels targeted monkfish, overall effort levels would increase (unless, of course, scallop DAS were reduced under scallop management actions). These vessels generally operate in the SFMA, and as a consequence, the impacts to protected species of increased trawl fishing effort will increase accordingly and could potentially affect sea turtles where overlap with the scallop fishery occurs.

Although not adopted in this amendment, except as an action that could be taken under the framework adjustment process, DAS transfer options could result in the activation of latent effort, or unused DAS by monkfish vessels, and the impact of the fishery on protected species could increase even further. Provisions to maintain conservation neutrality would mitigate this effect.

6.2.3.2.2 Trip Limits for Monkfish Incidental Catch

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs. The proposed increase is intended to reduce discards of monkfish by allowing specified vessels, including general category scallop and clam dredge boats (under a proposal adopted in this amendment), to retain rather than discard small amounts monkfish caught incidentally.

Given the very low trip limits proposed, these measures, as well as the No Action alternative, are not likely to have an impact on any protected species in the action area. At such low levels, especially when compared to value of the target species of these vessels, the poundage under consideration is not significant and should not appreciably affect monkfish effort or shifts in effort. Consequently it is not likely to change interactions with protected species beyond what currently exists in the identified fisheries. No action could result in the continued discarding of monkfish by the vessels in these fisheries and would continue the status quo with respect to protected species.

The proposed action to restore the incidental catch limit west of 72°30' to what was in place prior to the Multsipecies interim rule in 2001 (See Section 4.1.1.3) will not have a measurable effect on effort. Affected vessels fishing in this area under the monkfish incidental catch limit are targeting summer flounder and did not alter their fishing pattern subsequent to, or as a consequence of the reduced monkfish incidental catch limit. They simply discarded monkfish over the 50 lb. limit, according to reports by fishermen. Therefore, the impact of Alternative 2, the proposed action, on protected species is no different than Alternative 1 (no action).

6.2.3.2.3 Minimum Mesh Size on Directed Monkfish DAS

The Councils considered three alternatives, including the No Action alternative, for the minimum mesh size on trawl vessels on a monkfish only DAS. The Councils propose taking no action, but under the alternatives not adopted (Alternatives 2 and 3), Category A and B vessels on a monkfish DAS, as well as limited access scallop vessels on a monkfish DAS, would be required to use mesh larger than the current minimum size.

The Councils' intent is to minimize the bycatch of small monkfish and of other species on monkfish trawl vessels. Gillnet vessels currently are required to fish with 10-inch minimum mesh, but do not experience the same finfish bycatch problems as monkfish trawl gear. In fact, many participants in the gillnet fishery claim to already use mesh sizes larger than the current required minimum size. Potentially, the increased mesh size could reduce fishing effort in areas with a bycatch of multispecies, and cause effort to shift to areas where protected species are either more or less abundant than in the current fishery. As such, the outcome for any of the alternatives is unclear, but the changes in fishing patterns would affect the trawl sector only. As has been mentioned, takes of protected species are known to occur in bottom trawl fisheries, but based on current data, the risk of entanglement is lower than in the gillnet fishery. Since the Councils propose taking no action, no effort shifts can be attributed to this measure and it should not affect monkfish fishery interactions with protected species.

6.2.3.2.4 Minimum Fish Size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 10-inch minimum tail size (Alternative 2, Option 2), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch. Because none of the alternatives, including no action, would change catch targets or DAS/trip limit allocations, they would have little or no impact on the magnitude or distribution of effort, and, therefore, are expected to have a negligible impact on any protected species. If vessels do not high-grade their catch (discard smaller animals in favor of larger ones that may get a higher price per pound), it is possible they may reach their trip limit more quickly under these scenarios, resulting in trips that are shorter in duration. Gear in the water for shorter periods than under No Action alternative could benefit protected species because of the potential reduced risk of entanglement. Under the proposed action, the reduction in tail minimum size by three inches in only the SFMA is not expected to have an effect on the duration of trips.

6.2.3.2.5 Closed Season or Time Out of the Fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. This requirement affects all limited access monkfish vessels, except category C and D vessels with a scallop limited access permit.

In general, gear out of the water equates to fewer impacts to protected species. It could be inferred here that the alternative which doubles the time that gear must be removed from the water would have the most benefit to protected species. To the extent that benefits are realized, species most likely affected by a reduction in gear during the spring (under Alternative 3) period include right and humpback whales traveling from southern calving areas to northern foraging grounds, sperm whales shifting northward to the Mid-Atlantic Bight, sea turtles traveling to the Mid-Atlantic from wintering grounds in the south and harbor seals moving northward within the Gulf of Maine.

Conversely, the proposed action to eliminate of the requirement could be expected to have negative impacts to those protected species. The effects, however, are not so straightforward because individual vessels may elect to take their block out at any point during the March 1 –May 31 period with ample time left to use their 40 DAS allocation within the 90-day window. Therefore, varying amounts of gear will still be in the water even if the gear removal time were doubled.

6.2.3.2.6 Offshore SFMA Fishery Program

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2 (Area Option 1) (see Section 4.1.4). Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (DAS/Trip Limits Option 2). Within Alternative 2, however, the Councils considered, but non-preferred options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

Area Option 2 differs from the proposed action by restricting the offshore fishery program from operating along the southern flank of Georges Bank. Since both DAS/Trip Limits options represent different methods for calculating the trip limits and DAS allocated to participating vessels, based on the same overall annual allocation, the two options are equivalent from a biological perspective. Under the No Action alternative, fishing would occur in either area under the current rules.

Under the proposed action, the increased trip limits associated with the programs provide vessels with an incentive to shift effort from inshore areas to offshore, but overall effort would be reduced since DAS will be used at a higher rate as a requirement of participation, ensuring that fishing gear will be in the water less, compared to no action. Another mitigating factor for protected species, including sea turtles, is that they are less present in the area during the October through April season of the offshore fishery. Further, vessels must enroll annually in the program and carry a VMS, thereby enhancing monitoring of the portion of the fleet that chooses to participate, and potentially providing more information that could contribute to a better understanding of protected species and their overlap or interactions with the monkfish fleet, to the extent such interactions occur.

6.2.3.2.7 Modification of permit qualification for south of 38°00'N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

The Councils considered four alternatives to revise the limited entry qualification period for vessels that did not qualify for a permit under the original FMP, plus no action. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The impact on protected species of the non-preferred Alternatives 1, 2 and 4 are not significantly different than Alternative 3, compared to no action, since the number of affected vessels ranges from 3 to 7, with 5 expected to qualify under the proposed action, Alternative 3. These qualifying vessels fished for monkfish with large-mesh gillnets in the EEZ prior to 1999 when the FMP took effect.

Large mesh gillnets are subject to a series of closures in federal waters off North Carolina and north to Chincoteague by the Final Rule for Large Mesh Gillnet Fisheries, except in late winter and very early spring when turtles are less likely to be found. Following FMP implementation, these vessels fished for monkfish either in state waters or in the EEZ under an experimental fishery permit. The experimental fishery was discontinued, and the sea turtle closures further limited the ability of these vessels to fish for monkfish in the past two years. The proposed action, therefore, may result in some shift in effort from state waters to the EEZ, to the extent this activity is not constrained by the sea turtle closures. Furthermore, the proposed action could result in a modest, but not significant increase in overall monkfish effort if these vessels are currently not active in the fishery.

Overall, however, the impact on protected species is expected to be minimal due to the small number of affected vessels, the seasonal availability of monkfish in the area, the area restrictions of the proposed action (south of 38°20'N) and the sea turtle closures.

6.2.3.2.8 Modifications to the framework adjustment procedure

The Councils propose three additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6). They are implementation of: 1) transferable monkfish only DAS (sale or lease); 2) measures to minimize fishery impact on protected species, including sea turtles; and 3) bycatch reduction devices.

Since the proposed action is strictly administrative at this point (enabling future regulatory action through the framework adjustment procedure) there are no direct biological impacts of the following three measures. If, and when the Councils propose to take action under the framework procedure, the impacts of specific measures would be analyzed and discussed in the accompanying environmental impact documents. Because this alternative will enable the Councils to take timely action to implement measures to address protected species issues within the context of the FMP through framework adjustment, this measure indirectly benefits the protected species that are likely to interact with monkfish gear in the EEZ. Measures include, but are not limited to gear-specific seasonal/area closures or gear modifications.

6.2.3.2.9 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7). Few vessels are able (because of the size required to fish on the Grand Banks) or likely to take advantage of this measure. Encounters with deep water cetacean species such as sperm whales could occur in the area, but impacts are not likely to increase appreciably beyond that now occurring in the multispecies fishery which has had a similar exemption for a number of years. Although no vessels have availed themselves of this opportunity, even if some do, it is likely to be a small number and they will not likely affect the potential for encounters with protected species in an appreciable way.

6.2.3.2.10 Measures to Minimize the Fishery Impacts on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8). The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA (EFH Alternative 4, Option 3), and propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals and their habitat (EFH Alternative 5AB). The Councils considered but rejected an alternative trawl configuration specifically designed to minimize the impact of the monkfish fishery on EFH for groundfish species if DAS usage requirements were separated (EFH Alterntive 4, Option 2). The Councils also considered a second closure option to minimize the impacts of the directed monkfish fishery on deepwater corals (EFH Alternative 5C), which proposed to close up to 12 large canyons from Norfolk Canyon to the Hague Line.

EFH Alternative 1, no action, has been assessed with regard to impacts on protected species in the Monkfish FMP and subsequent framework adjustments as well as in the Biological Opinions prepared by NMFS for ESA Section 7 consultations. In the DSEIS, EFH Alternative 2 considered the effect of other Amendment 2 measures in protecting EFH, and is discussed in this document under the respective action items and alternatives. EFH Alternative 3 considered the effect of actions taken under Amendment 13 to the Multispecies Plan and Sea Scallop Amendment 10 on EFH as they affect monkfish vessels, and have been determined to have varying impacts that are not expected to appreciably increase the potential risks to protected species, although impacts vary by species. While adverse effects can and do occur under all of these management programs, none are considered by NMFS to jeopardize the continued existence of ESA-listed species, except for right whales. In that case, a Reasonable and Prudent Alternative has been implemented through the ALWTRP.

The option for a monkfish trawl configuration (Alternative 4, Option 2) considered but not adopted by the Councils may have benefits to protected species, if the ability of the net to "herd" fish is reduced and other effects have the potential to reduce the likelihood of sea turtle interactions. This conclusion, however, is speculative given that actual gear trials have not yet occurred. Further, although bottom trawls have documented takes of sea turtles, there are none documented in monkfish trawl gear. This is possibly an artifact of low observer coverage. More comprehensive monitoring of this component of the fishery should lead to a better evaluation of this potential.

The proposed action, Option 3, setting a 6-inch maximum roller disc diameter on monkfish trawls in the SFMA is not likely to be different than the no action alternative with regards to impacts on protected species, since that is the maximum size currently used by vessels in that area. The roller restriction will, however, serve to prevent those vessels from expanding their effort into complex bottom areas along the continental margin and offshore canyons.

Protection of deepwater corals (EFH Alternatives 5AB and 5C) through area closures could afford some level of protection to sperm whales and possibly other offshore species such as beaked whales, dwarf sperm whales, Risso's dolphins, pilot whales and common dolphins to the extent that their distribution overlaps with the fishery. The selected option that includes all vessels on a monkfish DAS will afford greater protection than the non-preferred option that would have applied just to trawl vessels.

6.2.3.2.11 Cooperative Research Program Funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP. One is based on a DAS set-aside, and the other on providing a limited exemption from DAS for vessels engaged in research. Both are expected to have neutral effects to protected species compared to no action in that they do not, in and of themselves result in any changes in effort. Projects undertaken within either program will be evaluated on a case-by-case basis as to their impacts on protected species, as the Experimental Fishery Program currently operates. The exemption or set-aside alternatives simply obviate the need for individual researchers to apply for DAS exemptions and conduct the required impact analysis with respect to the effects on monkfish fishing mortality.

Since Alternative 1 sets aside DAS from the existing pool of allocated DAS, effort is not likely to increase as a result of adopting this approach. Under Alternative 2, which provides an exemption from DAS, effort is also not likely to increase because the amount of DAS available under the exemption program is limited to the residual of the pool of DAS not distributed to vessels under the set-aside. In other words, the DAS being set aside under Alternative 1 are from the same currently unused portion of allocated DAS that would be used under the exemption program in Alternative 2. In either case, the proportion of DAS available under both alternatives is a small fraction of the total DAS used, and, therefore, likely to be insignificant.

6.2.3.2.12 Clarification of Vessel Baseline History

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

This action is an administrative change that does not result in any increase in fishing effort or direct change to the fishery, and, therefore, will not likely affect the fishery interaction with protected species.

6.2.3.2.13 NFMA Monkfish Trawl Experimental Fishery

The Councils considered but rejected a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS. The Councils rejected the proposal because vessels can already conduct such an experiment under current regulations, and, in fact, are. A two year trial would not affect protected species except to allow an adequate evaluation of its effects on listed and other protected species. Impacts at this time are unknown.

Taking no action would not affect protected species.

6.2.3.2.14 Change Fishing Year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) considered but did no adopt three alternatives for changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively. Alternative 1 is the no action alternative.

This is an administrative action and, therefore, these alternatives do not have any impact on protected species compared to taking no action.

6.3 Impacts on EFH

6.3.1 Habitat Assessment of alternatives designed to minimize impacts on EFH

This Amendment and FSEIS include a no action EFH alternative (Alternative 1, combined measures of DSEIS EFH Alternative 1 and EFH Alternative 3, due to FSEIS timing relative to implementation of Amendment 10 to the Scallop FMP and Amendment 13 to the Multispecies FMP). EFH Alternative 2 relies on the incidental habitat benefits of management measures considered in the DSEIS to have substantial benefits, other than those specifically designed to minimize EFH impacts. EFH Alternative 4, in the DSEIS, included options that focus on the direct adverse impacts of bottom trawls for 23 species with life stages with EFH that is potentially vulnerable to bottom trawls and dredges by regulating the configuration (Option 2) or roller gear (Option 3, adopted) of monkfish trawls. EFH Alternatives 5AB (proposed action) and EFH Alternative 5C (not adopted) focus on the impacts of the monkfish fishery on EFH for managed species and life stages found in deep-sea canyon communities. EFH Alternative 5, specifically, was intended to protect the deep-sea coral communities that occur in submarine canyon environments on the outer continental shelf. The monkfish fishery is one of the few fisheries that operate in deep water, and these alternatives are intended to minimize the potential interactions of monkfish gear with deepwater corals to avoid the impacts to the hard bottom that is EFH for many species in these areas. EFH Alternative 5AB, was originally considered as two separate alternatives, but combined by the NEFMC prior to completion of the DSEIS.

6.3.1.1 EFH Alternative 1 (No Action)

This option is the baseline EFH alternative, that is, the measures that would have been in effect if the Councils had taken no action on measures proposed in this Amendment, as well as under other amendments that would have an effect on EFH, such as Multispecies Amendment 13 and Scallop Amendment 10. Both Amendment 10 and Amendment 13 have been approved since the Councils completed development and analysis of this no-action alternative in the DEIS; therefore, this alternative includes measures implemented by Amendment 13 and Amendment 10. In the DSEIS Amendments 10 and 13 measures were identified as a separate alternative, EFH Alternative 3, but since they have been adopted, Alternative 3 is incorporated into this no action alternative. The following Table 94 describes the habitat impact of the no action alternative.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Closed season or time out of the fishery	Monkfish	Multispecies vessels (Monkfish Category C and D) are required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Authorized fishery programs	Monkfish	3. Offshore SFMA Fishery - Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas. 4. Permit qualification criteria may be revised with the effect of increasing the number of permits by 3-7. Vessels permitted under this program would be restricted to fishing south of 38°N.	3. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries. 4. Under no action, vessels are not permitted to fish in the EEZ and are, therefore, restricted to fishing in state waters. While this concentration of effort in nearshore areas could have negative habitat consequences if the vessels used mobile gear, but they currently only fish with gillnets, and are likely to continue doing so in the future, with no significant habitat effect.	**0**
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. Addition of Cashes as a year round closure	Year-round closures provide habitat benefits to the areas within the closures. The addition of Cashes Ledge as a year-round closure will benefit EFH. Rare kelp beds are found in that area.	**+**
Habitat Closed Areas	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	**+**
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravelly sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected scenarios (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	**+**
EFFORT REDUCTION MEASURES				
Monkfish DAS	Monkfish	Retain current requirement for vessels to	This alternative relies on the scallop and multispecies	**+**

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
usage by limited access permit holders in scallops and multispecies fisheries		use both monkfish DAS and scallop or multispecies DAS simultaneously	management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	
Trip limits for incidental catch	Monkfish	4. 50 lbs. (tails) per trip. 5. General category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish. 6. The area east of 74°00' is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30' and east of 74°00 went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip	4. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the small mesh multispecies, multispecies, fluke and other, exempted, fisheries. 5. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the general category scallop and surf clam/ocean quahog fisheries. 6. This measure may reduce allowable landings for large mesh multispecies vessels fishing between 72°30' and 74°00', but is not likely to alter the duration or intensity of fishing effort beyond that already experienced as a result of the large mesh multispecies fishery.	0
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	Mix of adaptive and phased effort reduction strategies. A days (60% of effective effort) B days (40% of effective effort) C days (FY01 allocation). Provides opportunity to fish on stocks that do not need rebuilding.	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	+
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
			provision cannot be sold.	
GEAR MODIFICATION MEASURES				
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	+
Minimum fish size	Monkfish	The current regulations apply different minimum sizes in the NFMA and SFMA, as follows: **NFMA:** 11 inches (tail) or 17 inches (whole) **SFMA:** 14 inches (tail) or 21 inches (whole)	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
NFMA Monkfish trawl experimental fishery	Monkfish	No monkfish trawl exempted fishery in the NFMA	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch rates and increase bottom time in areas where medium-small sized scallops are prevalent.	+
Ten inch twine tops	Scallop	As of May 1, 2004, all scallop dredges with limited access or general category permits are required to have twine tops with no less than 10inches.	Ten-inch twine tops will reduce by-catch, no direct habitat effects.	0
OTHER MEASURES				
Exemption program for vessels fishing outside of the EEZ (in the NAFO Regulated Area)	Monkfish	Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if the monkfish are caught outside of the EEZ.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
Clarification of vessel baseline history	Monkfish	Vessels that had another federal fishery permit and upgraded or downsized length, horsepower or tonnage prior to getting a monkfish permit have two different upgrading baselines.	It is unclear how this measure could impact EFH. While the potential exists for increasing effective effort on the monkfish fishery, particularly where a large discrepancy exists between baselines and the more restrictive baseline permit is dropped, there is no evidence that this increase in effective effort may translate into an increase in adverse impacts on EFH from fishing activities.	**Uncertain**
Change fishing year	Monkfish	The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	**+**
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	**+**

Table 94– Habitat Evaluation of the No Action alternative in Amendment 2 to the Monkfish FMP

6.3.1.2 EFH Alternative 2 (Benefits of other Amendment 2 measures)

This section summarizes the habitat impacts of the non-habitat measures considered in the Amendment 2 DSEIS, which, although not adopted by the Councils, could have had substantial benefits to EFH. Applying the benefits of these measures to achieve the habitat objectives of the Magnuson-Stevens Act would incur no additional regulatory burden on the fishing community or enforcement/monitoring agencies, since they are being adopted for other reasons. However, these measures may not minimize the adverse effects of fishing on EFH as effectively as the proposed habitat protection alternatives. Table 95 summarizes the non-habitat measures considered, but not adopted in Amendment 2 that could have had substantial positive impacts on EFH had they been adopted.

Alternative	Feature	Habitat Benefits
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Scallop and multispecies limited access vessels could fish under monkfish only DAS under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS.	Without the associated trawl gear requirement, separated DAS would allow for increased overall effort with no habitat benefit. However, if the proposed trawl gear configuration is adopted as part of the separated DAS alternative, separating DAS may actually reduce impacts to vulnerable EFH for several reasons.
Minimum mesh size on directed MF DAS	Increase the codend mesh from 10-inch square or 12-inch diamond mesh to 12-inch square mesh.	Expected to improve bottom habitat conditions iby reducing bycatch and mortality of benthic organisms. May reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species in areas where directed trawling for monkfish occurs.
NFMA Monkfish trawl experimental fishery		Potential for a positive impact on EFH if the gear tested is shown to reduce adverse effects on EFH.

Table 95- Potential habitat benefits of non-habitat Amendment 2 management alternatives

The three management measures identified in the table above are distinguished from the other measures considered in Amendment 2 because they were expected to have substantial positive impacts on EFH. It should be noted that other management measures that were considered in the Amendment 2 DSEIS could have some positive, negative, or no impact on EFH. The habitat impact of each non-habitat measure proposed in this Amendment is summarized in Section 6.3.2.

6.3.1.3 EFH Alternative 3 (Benefits of actions in other FMPs)

Alternative 3, which intended to use the habitat benefits of measures implemented in Amendment 10 to the Atlantic scallop FMP and Amendment 13 to the Northeast Multispecies FMP, has been absorbed into the No Action Alternative (EFH Alternative 1).

At the time of the preparation of the Amendment 2 DSEIS, the New England Council was considering significant measures to mitigate adverse impacts (via gear modifications, effort reductions and habitat closed areas) of fishing with trawls, scallop dredges and hydraulic clam dredges on EFH in Amendment 10 and Amendment 13. Because the timing of the Councils' deliberation on alternatives to include in the Monkfish Amendment 2 DSEIS occurred simultaneously with the final decisions by the New England Council on these other two major FMP amendments, the decision was made to include Alternative 3 in the DSEIS. This decision was made with the understanding that if Amendment 10 and 13 were implemented prior to the submission of Council decisions on Amendment 2, then the measures outlined in Alternative 3 would become part of the No Action alternative as the implemented measures are considered part of the Status Quo. As such, all status quo measures that may have a habitat impact have been outlined in Alternative 1. See Table 94 for a description of the No Action Alternative for EFH and the estimated habitat impacts.

6.3.1.4 EFH Alternative 4 (Monkfish trawl configuration)

This alternative includes trawl configuration options that are specifically designed to minimize the impact of the monkfish fishery on EFH by both reducing the ability to use monkfish trawls on hard bottom and reducing the ability (incentive) of the gear to catch groundfish that are managed under the Multispecies FMP.

6.3.1.4.1 Option 2 (not adopted)

The Councils considered requiring specific trawl gear when a vessel is on a monkfish DAS (not a combined DAS), either as a complete package or individual elements from the following proposal based on public comment.

1. Max disc diameter on sweep
  Option A: *12-inches both areas*
  Option B: *6-inches SFMA only*
  Option C: *16-inch North only, configured so discs can roll (with only one wire or chain)*
2.Maximum ratio of headrope to footrope length of 1:1.1 to eliminate overhang
3. No ground cable, or maximum distance between doors and wings cannot be greater than ½ the length of the vessel
4. Upper and lower legs must be even
5. Minimum mesh size
Option A: (no action) *10" sq or 12" dia. (codend only), Multispecies mesh in the body*
  Option B: *10" sq or 12" dia. (entire net)*
  Option C: *12" sq. (codend), 12" dia. (body and wings)*
  Option D: *12" sq. (codend only), Multispecies mesh in body*
6. Two-seam net construction requirement

6.3.1.4.2 Option 3 (proposed action)

The Councils propose to restrict the roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS in the SFMA.

Discussion/Rationale for Options 2 and 3

Relationship between monkfish behavior and the configuration of trawls:
Observations of monkfish behavior in the vicinity of a trawl show that herding is not a factor, minimizing the need for the gear to create a dust cloud, but increasing the importance of the wings of the net, which are often extended on monkfish trawls. Further, monkfish do not attempt to escape upwards, as do roundfish, allowing for a lower headrope than is needed on a groundfish trawl.

Sediments: The primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. While in the southern area the bottom characteristics are more consistent over large areas, in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface.

Gear Used: These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud.

Fishing Behavior: Furthermore, since most vessels are required to use a multispecies DAS while fishing for monkfish, they currently fish in areas where they can target both groundfish and monkfish. A directed, monkfish-only trawl fishery could occur if vessels fished solely on muddy bottoms. If retention of groundfish were prohibited, vessels would have no incentive to fish on the more complex bottom types where those species would be caught in combination with monkfish.

Summary: A trawl net configuration was developed with the goal of increasing fishing efficiency for targeted monkfishing, taking into account fish behavior and bottom types, while reducing the incentive and ability to fish in more complex bottom areas which are essential fish habitat for many groundfish species. Increased efficiency would reduce the time gear would be in contact with the bottom for a given target catch or trip limit. By removing the incentive and ability to fish in hard bottom, the strategy would effectively eliminate the impact of the monkfish trawl fishery on essential fish habitat for many groundfish species that depend on those areas during most life history stages.

The Councils did not adopt Option 2 because they do not feel the trawl design has been scientifically demonstrated to achieve the objectives. Furthermore, since they are not separating DAS usage requirements, trawl vessels in the NFMA would not be fishing on monkfish-only DAS and most of the affected vessels would be in the SFMA. The Councils expect that the mesh size and roller restriction (Option 3) applicable to those vessels would achieve the same result in the SFMA as Option 2 was intended to in the NFMA.

6.3.1.5 EFH Alternative 5 (protection of deep-sea canyon communities)

The EFH Final Rule states that FMPs must minimize the adverse effects of fishing on EFH, to the extent practicable (600.815(a)(2)(ii)). Adverse effects are defined to mean "any impact that reduces the quality and/or quantity of EFH" and may include "direct, or indirect, physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species, and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH." Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions" (600.810(a)). The scope of the regulations is rather broad and provides a basis for closed area management alternatives that address the potential indirect habitat or ecosystem impacts of fishing on EFH, as well as the direct impacts on EFH, in offshore canyon habitats. Impacts to offshore canyon habitats, which include deep-water coral species, has a direct adverse impacts on EFH that is more than minimal and less than temporary in nature; therefore, the Councils are considering alternatives to minimize those impacts.

Since this Amendment considered and approved the expansion of the offshore directed monkfish trawl fishery in the southern fishery management area, the Councils considered two options to minimize the potential impacts of that fishery on deep-sea canyon habitats (See Section 4.1.4 for a description of the measures and Section 6.3.2.6 for an evaluation of the habitat effects of these measures). Within these hard-bottom habitats, a variety of species of deep-sea corals have been found which are known to provide structured habitat and shelter for some species of demersal fish and invertebrates (see Section 5.1.6).

The directed monkfish fishery is conducted with bottom trawls and bottom gillnets, primarily in coastal and offshore waters of the Gulf of Maine, on the northern edge of Georges Bank, and in coastal and continental shelf waters of southern New England (Figure 69 and Figure 70), including offshore waters on the edge of the continentalshelf, near the heads of several deepwater canyons (Figure 76). One of the proposed fishery management measures that has been approved by the Councils (see Section 4.1.4) would increase the probability that the offshore fishery for monkfish will expand in the future, within the area shown in Figure 2. Deep-sea corals are known to exist in some of the submarine canyons in this area (Figure 72). Furthermore, EFH for some federally-managed species extends beyond the edge of the continental shelf and includes portions of some of the canyons (see Section 6.3.1.5.3). Therefore, the possible expansion of the directed offshore monkfish fishery – either spatially into new areas or in terms of increased fishing intensity in existing areas - increases the probability of adverse impacts to EFH, canyon habitats, and deep-sea corals. Alternative 5 is intended as a precautionary measure to prevent any potential direct or indirect impacts of an expanded offshore monkfish fishery on EFH and offshore canyon habitats.

Following the NMFS guidance entitled *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Oct 2002), as step-by-step evaluation of habitat impact evaluation was conducted by the PDT. First, a description of the gears used in this fishery and an evaluation of the spatial distribution of their use in the Northeast region was conducted. Next, the results of scientific studies of the habitat impacts of these gears on different habitat types were summarized and an evaluation was made of the species and life stages of federally-managed species in the region with EFH that was determined to be vulnerable to the effects of different types of fishing gear. This information is presented in Appendix II to this FSEIS.

A summary of EFH and substrates contained in deep-sea canyons in the region based on the best available science was prepared (Section 6.3.1.5.3 and Section 6.3.1.5.4). This section of the FSEIS also included an assessment of additional information about the presence of managed species within the two canyons included in the proposed action (Alternative 5AB), including available data from submersibles, underwater camera surveys, NMFS trawl surveys (Section 6.3.1.5.5), and preliminary results from a recent NMFS deepwater biodiversity cruise (Section 6.3.1.5.6). Although the data are limited, these analyses confirm that there are federally-managed species within the Alternative 5AB proposed closure areas, and that some of these species have EFH defined as hard substrates in depths greater than 200 meters. Furthermore, the EFH designations for juvenile and/or adult life stages of six of these species overlap with the two areas proposed for closure under this alternative. Some type of hard substrate is included in the EFH description for all six of these species. EFH for all six of these species has been determined to be moderately or highly vulnerable to the effects of bottom trawls and minimally vulnerable to bottom gill nets. Corals are not currently included in the EFH descriptions for any species in the Northeast region; however, deep-sea species of coral are known to grow on hard substrates. Since there are corals found with the proposed closed areas, this is indicative of hard bottom and some coral species are thought to function like other epi-benthic fauna that provide relief and shelter, and are known to be particularily vulnerable to damage or loss by bottom trawld and bottom gillnets (Section 5.1.6 and Section 5.4.1.7).

Protection of deep-sea corals is a relatively new concept in this region and the Councils asserted that there may be several statutory and regulatory authorities that support the Councils' initiative to protect deep-sea coral habitats, whether or not corals have been specifically identified as EFH for managed species. These authorities include the EFH Final Rule, discretionary provisions of the Magnuson-Steven Act, as well as bycatch provisions of the Magnuson-Stevens Act. National Standard 9 of the Magnuson-Stevens Act requires that management plans minimize bycatch to the extent practicable. NOAA fisheries consider bycatch to include finfish, shellfish, invertebrate species, and all other forms of marine animal and plant life. In the Response to Comments on the National Standard One Guidelines, the specifics of what constitutes as bycatch was examined. Based on the Response to Comment #4, NOAA Fisheries interprets bycatch to include a wide variety of marine species, with or without commercial value. Therefore, there may be regulatory justification to consider alternatives to reduce the impacts of the offshore monkfish fishery on deep-sea coral habitats.

6.3.1.5.1 Overlap of directed monkfish effort and location of known deep-sea corals

The degree of spatial overlap of monkfish fishing and deep-sea corals was evaluated. The data used are described in more detail in the paragraphs below. In summary, the degree of overlap is very small based on the data used, in terms of fishing activity within the submarine canyons. However, since there may be potential for expansion of the offshore fishery, the Councils developed two alternatives to protect canyon habitats that include deep-sea corals (Alternative 5AB and Alternative 5C).

Monkfish Effort Data: The monkfish fishery is described in more detail in Section 5.3. The fishery in the southern fishery management area (SFMA) is primarily a directed fishery, while monkfish is more often caught incidentally to other groundfish species in the northern fishery management area (NFMA). Figure 69 through Figure 71 depict the "directed" monkfish trips spatially by gear type for fishing years 1999 and 2001. A directed trip is defined in the analysis as any trip where total landings are made up of more than 50% monkfish (whole fish weight).

Coral Location Data: Available coral presence data were compiled during the development of these alternatives. Two primary databases were used: Theroux and Wigley data (TW) from the NMFS Benthic Invertebrate Database compiled in 1998 (see Theroux and Wigley 1998, Wigley and Theroux 1981), and Watling and Auster data (WA) compiled in 2003 from a variety of sources (Watling and Auster, in press; Watling et al. 2003). The WA database includes records from several sources including museum collections, submarine observations, and underwater camera tows. The TW database contains about 550 records (about 400 of "hard corals" and about 150 of "soft corals"). For this document, "hard corals" include several species within the subclass Hexacorallia (Zoantharia). "Soft corals" include species that are within the subclass Octocorallia, which include both soft coral species (order Alcyonacea) and gorgonians (order Gorgonacea), or sea fans. Note that sea pens have *not* been included in the "soft coral" classification for either database. There was some overlap between the two databases; roughly 26 of the records in the WA database were taken from the TW database. In all, the WA database (which is still being developed) includes 761 geo-referenced records for 25 species in 10 taxonomic families. Distribution maps based on these data show presence only, i.e., they only describe where corals that could be identified were observed or collected. There are no data that show where deepwater explorations have occurred and not encountered coral. For this reason, the distributions of deepwater corals are somewhat unknown, since all areas have not been surveyed and since some specimens were not identified. However, the combination of these two databases represents the best available data on the presence of deepwater corals in this region.

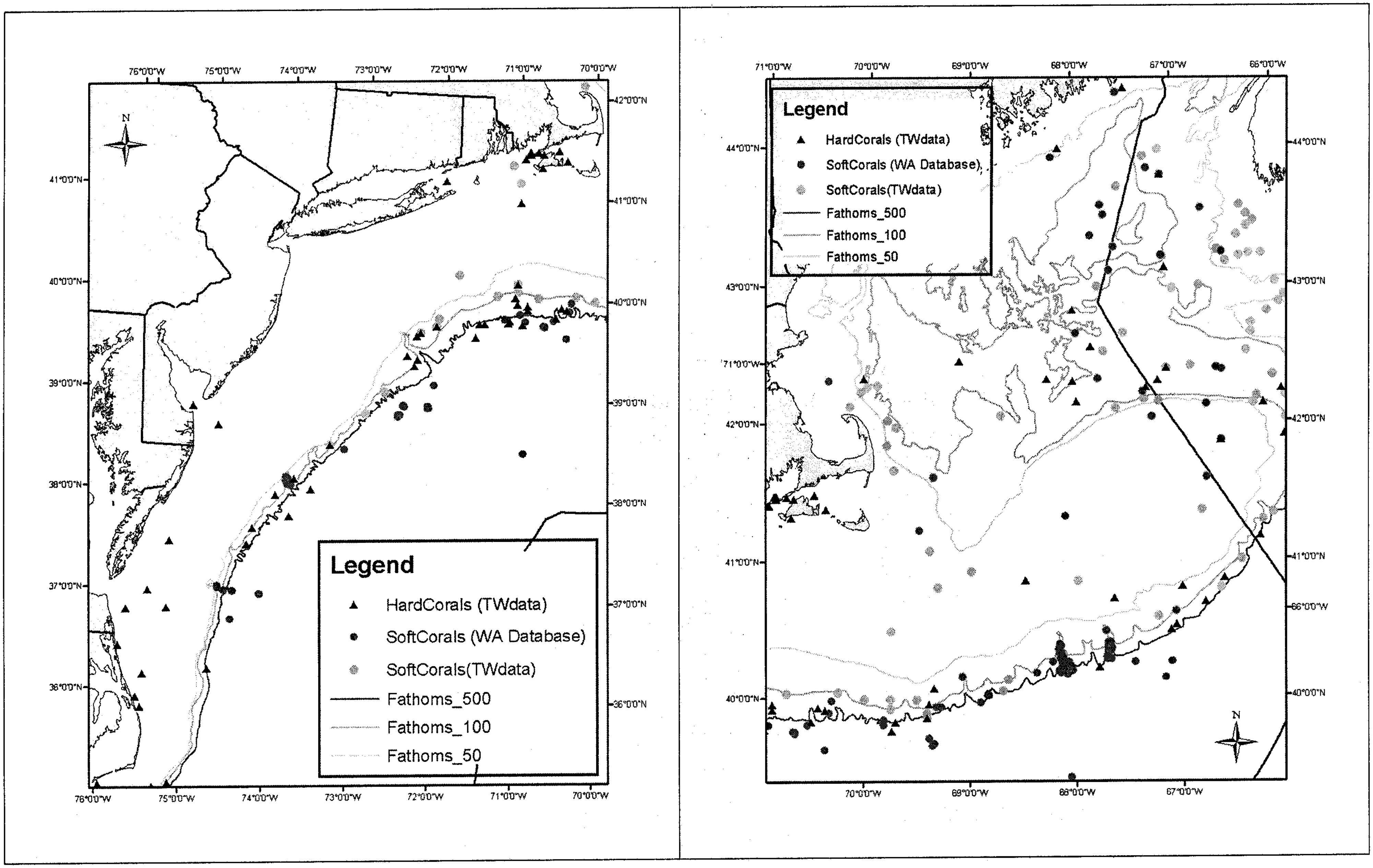


Figure 72: Presence of both hard and soft coral in the Northeast region (*Two primary sources: Watling et al., 2003 and Theroux and Wigley, 1998*).

6.3.1.5.2 Development of alternatives to protect deep-sea coral habitats

Three strategies were developed and used to identify a range of closed area alternatives to protect deepwater corals in the region.

Strategy One: Close areas deeper than a specific depth

Strategy Two: Close areas in canyons that are known to contain concentrations of coral,

Strategy Three: Close areas where directed monkfish effort overlaps with areas where concentrations of deepwater corals are present

The Habitat Committee considered the alternatives developed to meet these three strategies, but chose to forward a subset to the Council for consideration. For each of the options below there are two sub-options that specify which gears will be prohibited from these areas. Note that the Monkfish FMP does not permit dredge gear to direct on monkfish; therefore the potentially adverse impacts by this gear type should be managed under other FMPs, such as the Sea Scallop FMP. Although directed monkfish effort does not currently take place in all areas where coral have been found, there is a possibility that effort may increase into deeper waters and the distribution patterns of gears used in the fishery may change, particularly if the Monkfish and Multispecies DAS are separated. However, the proposed action does not include the separation or de-coupling of DAS at this time. However, the proposed action does not include the separation or de-coupling of DAS at this time.

6.3.1.5.2.1 EFH Alternative 5AB (Oceanographer and Lydonia Canyons Closure) (proposed action)

This alternative was initially developed as two separate alternatives, but combined by the NEFMC prior to submission of the DSEIS. The original intent of this alternative was to close Oceanographer Canyon and Lydonia Canyon to trawling in waters deeper than 500 meters because that is the depth that has been identified as a reasonable depth that would protect most of the deepwater species without closing waters throughout the entire range of all deepwater corals. However, e using depth contours in areas of high relief would be very difficult to interpret and enforce. Therefore, a similar alternative was developed that closes the Canyons in a form that is more easily enforceable and that does not close waters shallower than 200 meters. See Figure 73 and coordinates are provided in Table 97.

Alternative 5AB -Option 1: Closed to trawl gear only (on a monkfish DAS)
Alternative 5AB -Option 2 (proposed action): Closed to all gears on a monkfish DAS (trawl and gillnets)

6.3.1.5.2.2 EFH Alternative 5C (up to 12 large, steep-walled canyons closures) (not adopted)

This option proposed to close waters above up to 12 large canyons, based on the premise that many deepwater corals need hard substrate and are predominately found on hard substrate within canyons, not on the slope. Although research has not been conducted in every large canyon in the region, the canyons with hard substrate and steep walls are likely to have corals, since other canyons with similar characteristics do. See Figure 74 and coordinates are provided in Table 98.

EFH Alternative 5C -Option 1: Closed to trawl gear only (on a monkfish DAS)
EFH Alternative 5C -Option 2: Closed to all gears on a monkfish DAS (trawl and gillnets)

Alternative	AREA (nm2)
5 AB (Proposed Action)	116
5 C	508

Table 96 – Area in square nautical miles of both coral protection alternatives

	Latitude		Longitude	
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
	40	27	67	38

Table 97 - Coordinates of Habitat Alternative 5AB (Proposed action)

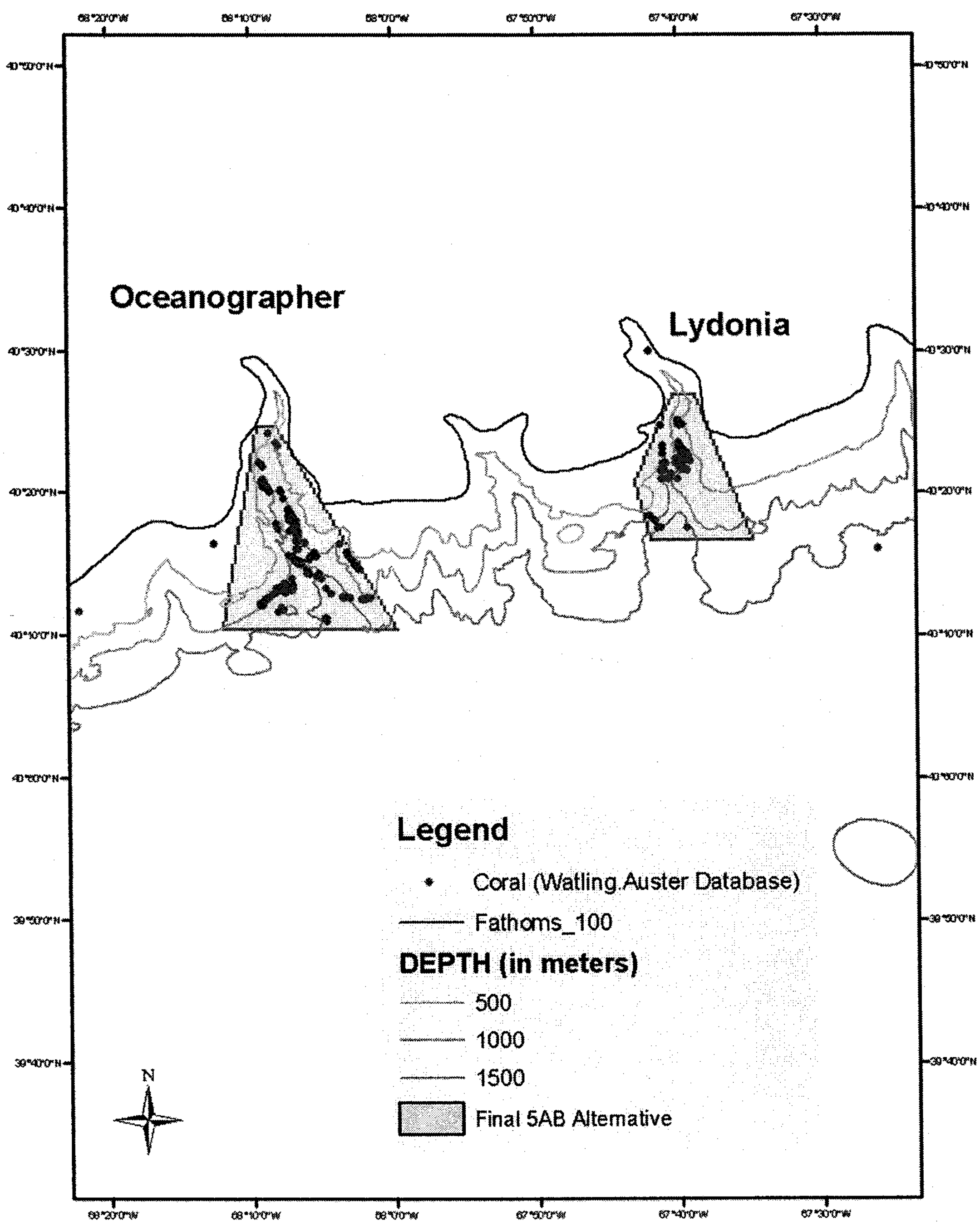
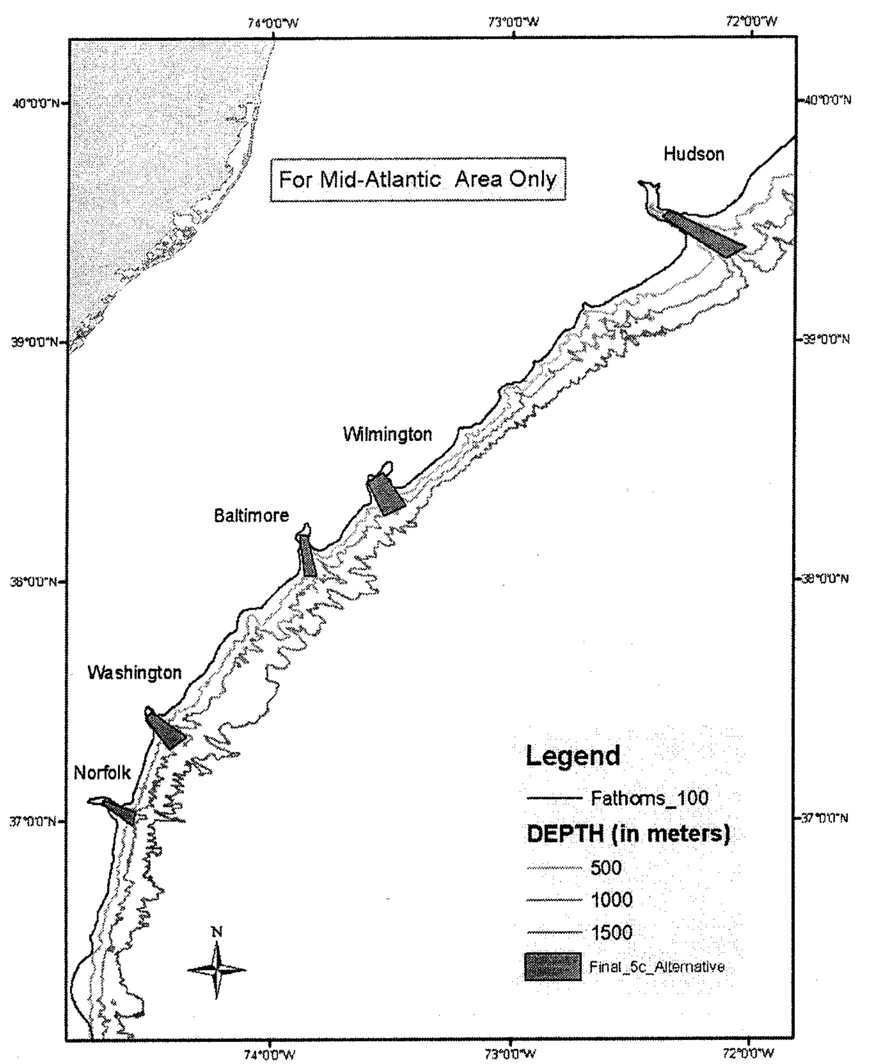


Figure 73 - Habitat Alternative 5 AB (shaded areas in Oceanographer and Lydonia Canyon) (Proposed action)
Note that location of known soft coral is mapped as well (Watling and Auster).



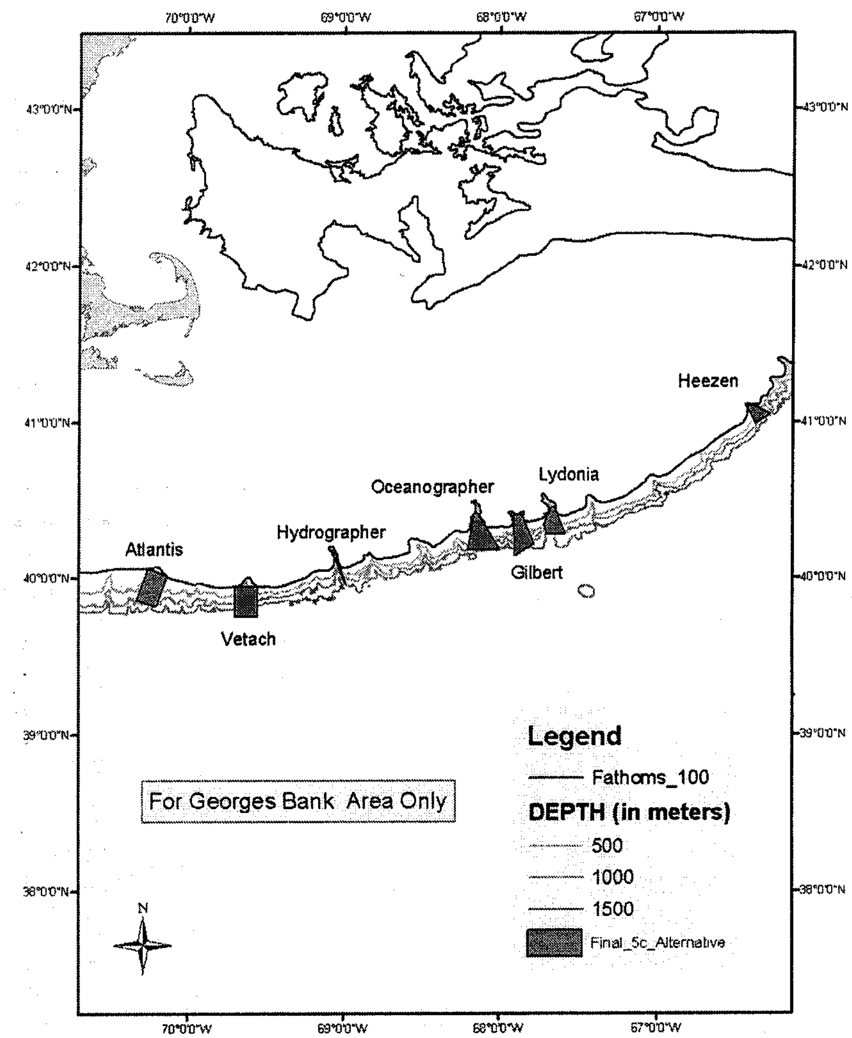


Figure 74 – Habitat Alternative 5 C –
Note that two maps are provided so the areas can be seen more clearly, but this alternative contains areas in up to 12 deep-water canyons

	Latitude		Longitude	
Norfolk	36	58	74	34
	37	4	74	41
	37	5	74	41
	37	2	74	33
Washington	37	17	74	25
	37	25	74	30
	37	27	74	29
	37	21	74	20
Baltimore	38	1	73	51
	38	11	73	52
	38	11	73	50
	38	0	73	48
Wilmington	38	16	73	31
	38	24	73	35
	38	27	73	31
	38	18	73	26
Hudson	39	20	72	6
	39	31	72	22
	39	32	72	20
	39	23	72	1
Atlantis	39	51	70	19
	40	3	70	14
	40	0	70	7
	39	49	70	12

	Latitude		Longitude	
Veatch	39	45	69	41
	39	56	69	41
	39	56	69	32
	39	45	69	32
Hydrographer	39	57	68	59
	40	10	69	4
	40	10	69	3
	39	57	68	58
Oceanographer	40	10	68	12
	40	24	68	9
	40	24	68	8
	40	10	67	59
Gilbert	40	8	67	53
	40	23	67	54
	40	24	67	51
	40	13	67	46
Lydonia	40	16	67	34
	40	16	67	42
	40	20	67	43
	40	27	67	40
	40	27	67	38
Heezen	40	59	66	22
	41	5	66	25
	41	6	66	23
	41	2	66	16

Table 98 - Coordinates for Habitat Alternative 5C

Overlap of Directed Monkfish Fishery and Alternative 5AB

VTR data from 1999 and 2001 suggests that there is no overlap between the proposed closure and the directed monkfish fishery (Figure 75). There are only 5 trips (3 in 1999 and 2 in 2001) that are displayed in the figure below, and none of them are within the boundaries of this alternative.

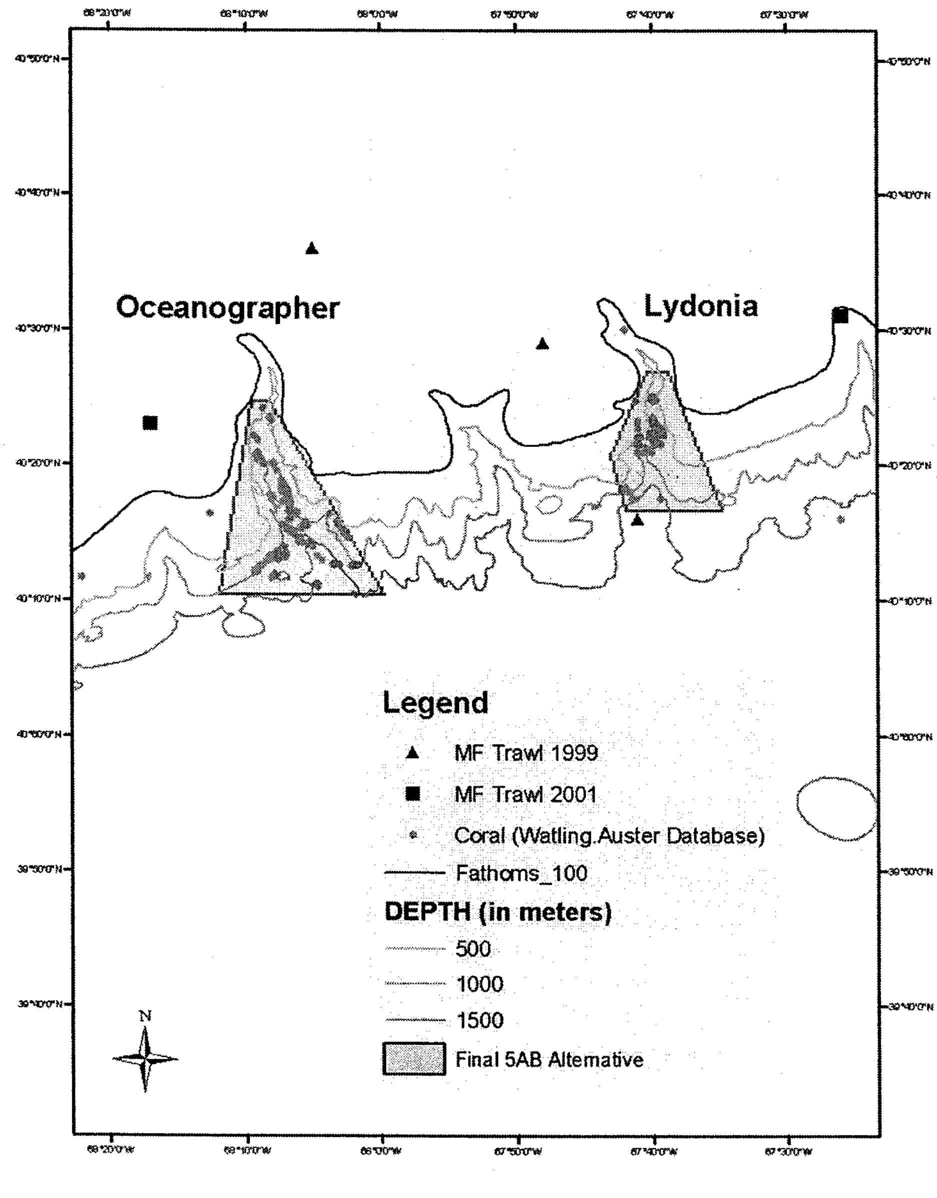


Figure 75– 1999 and 2001 directed monkfish otter trawl trips near Alternative 5AB (source: 2001 VTR).

Note: no directed gillnet trips were reported in this vicinity.

Overlap of Directed Monkfish Fishery with Alternative 5C

The primary area of overlap with the directed monkfish fishery is in the vicinity of Atlantis Canyon (due south of Nantucket) (Figure 76). Directed monkfish trips were also present in and around some of the other deep-water canyons, such as Vetach and Heezen canyons. Overall, nine directed monkfish trawl trips were reported within Alternative 5C in 1999 and less than 3 were reported in 2001. In 1999, no directed monkfish gillnet trips were reported within areas contained by Alternative 5C, and in 2001 21 trips were reported in these areas (in Atlantis and Heezen canyons). The number of reported trips overlapping with this alternative is very small.

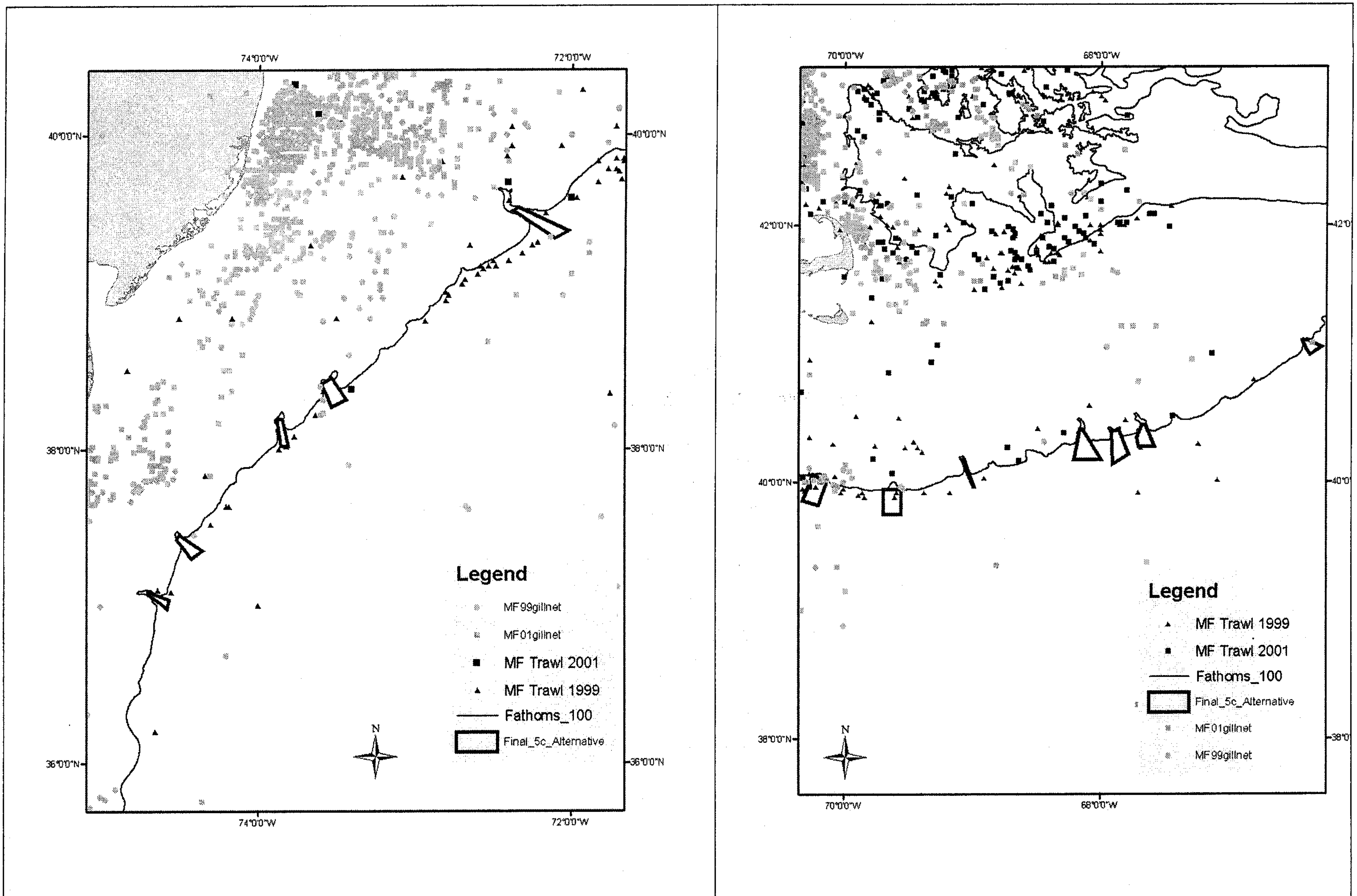


Figure 76 – 1999 and 2001 directed monkfish trips by trawl and gillnet gears in the vicinity of Alternative 5C (source: VTR database).

6.3.1.5.3 EFH within the deep-sea canyon closed area

The Habitat PDT then evaluated the EFH contained within the proposed deep-sea canyon closed areas based on the best available science. The data used in this analysis are described in more detail in the paragraphs below.

EFH Data: Essential Fish Habitat (EFH) has been designated for life stages of 39 species in the region by the New England and Mid-Atlantic Fishery Management Councils. Each species and life stage has a written, legally binding definition of EFH and the EFH area of most species has been delineated based on their abundance from annual stock assessment surveys in the region. For most species in New England and the Mid-Atlantic, EFH has been mapped for each species and life stage by individual ten-minute squares (TMS) of latitude and longitude. This information was used to identify the species and life stages with EFH within the two proposed Alternative 5 closed areas.

Table 99 describes the EFH for the benthic life stages of all federally-managed species in this region. It includes the geographic area, depth range, seasonal occurrence, and EFH description (i.e., substrates) for each species and life stage. Species with EFH that has been determined to be moderately or highly vulnerable to the effects of otter trawl gear are shaded, and species with EFH defined in waters deeper than 200 meters are in boldface. Appendix II describes in detail the gear effects evaluation, which determined which species have EFH which is vulnerable to various fishing gear types. Adverse EFH impacts of bottom gillnets were attributed to a number of species, but they were minimal. Therefore, the direct effects analysis is limited to bottom trawl impacts. Indirect effects include the potential impacts of bottom trawls and bottom gill nets, since both gears can cause the damage or loss of attached benthic organisms such as corals that are part of canyon ecosystems.

Species and life stages that could potentially benefit from the habitat protection provided by closed areas in the canyons are those with benthic EFH that is more than minimally vulnerable to bottom trawls, extends to depths greater than 200 meters, and includes some type of hard substrate (gravel, rocks, pebbles, etc.). These species and life stages are listed below.

Species and life stages with EFH more than minimally vulnerable to otter trawl gear (42): American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), pollock (A), ocean pout (E, J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Species and life stages with EFH more than minimally vulnerable to otter trawl gear and designated in waters deeper than 200 meters (22):
Atlantic halibut (A), Pollock (A), Redfish (J, A), Silver hake (J), Witch flounder (J, A), Tilefish (J, A), Barndoor skate (J, A), Clearnose skate (J, A), Rosette skate (J, A), Smooth skate (J, A), Thorny skate (J, A), Winter skate (J, A), and White hake (J).

Species and life stages with EFH more than minimally vulnerable to otter trawl gear and designated in waters deeper than 200 meters and hard bottom (17):
Pollock (A), Halibut (A), Redfish (A, J), Silver hake (J), Tilefish (J, A), Clearnose skate (J, A), Barndoor skate (J, A), Smooth skate (J, A), Thorny skate (J, A), and Winter skate (J, A).

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150		Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175		Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	**adult**	**GOME, GB**	**100 - 700**		**Bottom habitats with a substrate of sand, gravel, or clay**
Atlantic salmon	juvenile	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny's, Passagassawaukeag, Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart and Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass. Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	10 - 61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 - 92 cm/s
Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, and silt

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100		Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Goosefish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Goosefish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80		Bottom habitats, often smooth bottom near rocks or algae
Offshore hake	**juvenile**	**Outer continental shelf of GB and southern NE south to Cape Hatteras, NC**	**170 - 350**		**Bottom habitats**
Offshore hake	**adult**	**Outer continental shelf of GB and southern NE south to Cape Hatteras, NC**	**150 - 380**		**Bottom habitats**
Pollock	**juvenile**	**GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay**	0 – 250		**Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks**
Pollock	**adult**	**GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound**	**15 – 365**		**Hard bottom habitats including artificial reefs**

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130		Bottom habitats in depressions with a substrate of sand and mud
Redfish	**juvenile**	**GOME, southern edge of GB**	**25 - 400**		**Bottom habitats with a substrate of silt, mud, or hard bottom**
Redfish	**adult**	**GOME, southern edge of GB**	**50 - 350**		**Bottom habitats with a substrate of silt, mud, or hard bottom**
White hake	**adult**	**GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay**	**5 - 325**		**Bottom habitats with substrate of mud or fine grained sand**
Silver hake	**juvenile**	**GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay**	**20 – 270**		**Bottom habitats of all substrate types**
Silver hake	**adult**	**GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay**	**30 – 325**		**Bottom habitats of all substrate types**
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand
Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 – 10 (1 - 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrates of mud, sand, grave
Witch flounder	**juvenile**	**GOME, outer continental shelf from GB south to Cape Hatteras**	**50 - 450 to 1500**		**Bottom habitats with fine grained substrate**
Witch flounder	**adult**	**GOME, outer continental shelf from GB south to Chesapeake Bay**	**25 - 300**		**Bottom habitats with fine grained substrate**
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Red crab	**juvenile**	**Southern flank of GB and south the Cape Hatteras, NC**	**700 - 1800**		**Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites**
Red crab	**adult**	**Southern flank of GB and south the Cape Hatteras, NC**	**200 - 1300**		**Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites**
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Found in coastal areas (April to December, peak June to November) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Wintering adults (November to April) offshore, south of NY to NC; inshore, estuaries from May to October	Structured habitats (natural and manmade), sand and shell substrates preferred

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Ocean quahog	**juvenile**	**Eastern edge of GB and GOME throughout the Atlantic EEZ**	**8 - 245**		**Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras**
Ocean quahog	**adult**	**Eastern edge of GB and GOME throughout the Atlantic EEZ**	**8 - 245**	**Spawn May to December with several peaks**	**Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras**
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Spawn summer to fall	Throughout substrate to a depth of 3 ft within federal waters
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 -185)	Wintering adults (November to April) are usually offshore, south of NY to NC	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Spiny dogfish	**juvenile**	**GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay**	**10 - 390**		**Continental shelf waters and estuaries**
Spiny dogfish	**adult**	**GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay**	**10 - 450**		**Continental shelf waters and estuaries**

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150 m in colder months	Demersal waters and estuaries
Tilefish	**juvenile**	**US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)**	**76 - 365**	**All year, may leave GB in winter**	**Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris**
Tilefish	**adult**	**US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)**	**76 - 365**	**All year, may leave GB in winter**	**Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris**
Red drum	juvenile	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found throughout Chesapeake Bay from September to November	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars, and front beaches
Red drum	adult	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast; shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs
Spanish mackerel, cobia, and king mackerel	juvenile	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Spanish mackerel, cobia, and king mackerel	adult	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Golden crab	juvenile	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Golden crab	adult	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Barndoor skate	juvenile	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Clearnose skate	juvenile	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Seasonal Occurrence	EFH Description
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	May to September	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

Table 99 – EFH designations for managed species in the Northeast region. Species with EFH vulnerable to bottom tending gear are shaded, and species with a portion of their EFH designated in waters deeper than 200 meters are in boldface.

EFH Composition of Alternative 5AB and 5C

Monkfish inhabit deep water, but their EFH is not considered to be vulnerable to mobile, bottom-tending gear because juvenile and adult monkfish are distributed over a wide geographic range and depth range, and inhabit a variety of bottom substrates (see Section 5.4.1.2). Thus, the direct EFH benefits of the proposed habitat closed areas are assessed in terms of the degree to which they contain EFH for any of the species with vulnerable EFH in depths greater than 200m. Indirect EFH benefits are assessed in terms of the protection afforded to deep-water corals and other types of epifauna that grow on hard substrates within the proposed closures, and are highly vulnerable to bottom trawling (see Appendix II).

Direct effects of bottom trawling on the quality and/or quantity of EFH within Alternative 5AB or 5C would be limited to any of the species and life stages listed in Table 99 with EFH that overlaps spatially with the proposed closures. For Alternative 5AB, there are six species and eight life stages with EFH that is vulnerable to bottom tending gear that is designated within a portion of one or both of the 5AB closures (Table 100). These are redfish (A and J), barndoor, smooth, thorny, and winter skate (all juvenile life stage), and tilefish (A and J). The locations of partial ten-minute squares within Alternative 5AB are shown in Table 101 and Figure 77. Overall, not many of the ten-minute squares within Alternative 5AB contain many of the species with vulnerable EFH deeper than 200 meters. This is largely due to the fact that the EFH designated ten-minute squares are based on trawl survey data that were collected primarily in depths <200 meters. Thus, the small number of EFH-designated species in these two canyons is largely an artifact of the EFH designation methodology that was used.

There are many more (49) ten-minute squares (TMS) that overlap to some degree with the 12 Alternative 5C closures (Figure 78), but only one additional species (clearnose skate A and J) is added to the list of species that might benefit from these closures (Table 101). Also added to the list are the adult stages of the other four skate species. Ten of these TMS include five or more of the 14 species and life stages listed for this alternative, all of which are located in the five eastern-most canyons on the southern edge of Georges Bank (Figure 78).

Of the EFH-designated species and life stages that might benefit from habitat closures that prohibit the use of monkfish bottom trawls or gill nets in the canyons, all are known to inhabit substrates that include hard bottom which supports the growth of corals and other types of attached epifauna that are susceptible to damage or removal by these two gears (Table 99). Redfish is probably the most important species given its known association with structure-forming benthic organisms (Auster, in press). Redfish is a more northern species and is designated in a number of TMS in deep water on the southern edge of Georges Bank.

	Ten Minute Square Number									
Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**SUM**
Redfish A	Yes	N	Yes	N	N	Yes	N	Yes	Yes	5
Redfish J	Yes	N	Yes	N	N	N	Yes	Yes	Yes	5
Skate Barndoor J	N	N	Yes	N	N	Yes	Yes	Yes	Yes	5
Skate Smooth J	N	N	N	N	N	N	N	Yes	Yes	2
Skate Thorny J	N	Yes	Yes	N	N	Yes	N	Yes	N	4
Skate Winter J	N	Yes	Yes	N	N	Yes	N	N	Yes	4
Tilefish A	N	N	N	N	N	Yes	N	N	N	1
Tilefish J	N	N	Yes	N	N	N	N	N	N	1
SUM	2	2	6	0	0	5	2	5	5	

Table 100 – Species with vulnerable EFH designations for ten-minute squares within Alternative 5AB. *(Presence = Yes and Absence = N)*

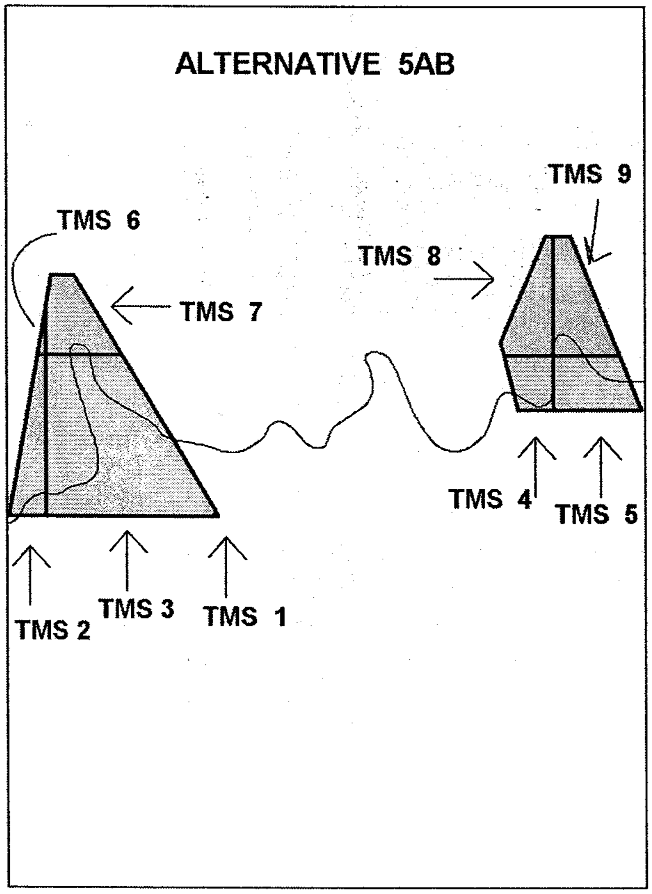


Figure 77 – Location of ten-minute squares (TMS) with EFH designations for Alternative 5AB (compare to Table 100)

Ten Minute Square Numbers

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Redfish A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Redfish J	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y
Skate Barndoor A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Barndoor J	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Clearnose A	Y	N	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Clearnose J	Y	N	Y	N	Y	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Smooth A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Smooth J	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	Y
Skate Thorny A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Thorny J	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Winter A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Skate Winter J	N	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
Tilefish A	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	Y	Y	N	Y	N	N	N	N	N	N	N
Tilefish J	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	N
SUM	**2**	**0**	**2**	**0**	**1**	**1**	**0**	**4**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**2**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**

Species	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	SUM
Redfish A	N	N	Y	N	N	Y	N	N	Y	N	Y	Y	N	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	**12**
Redfish J	N	N	N	N	N	Y	N	N	Y	N	Y	Y	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	**13**
Skate Barndoor A	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	**2**
Skate Barndoor J	N	N	Y	Y	N	Y	N	Y	N	N	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	Y	**12**
Skate Clearnose A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	**3**
Skate Clearnose J	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	**5**
Skate Smooth A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	**1**
Skate Smooth J	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N	Y	Y	Y	Y	Y	**11**
Skate Thorny A	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	**1**
Skate Thorny J	N	N	Y	N	N	Y	N	N	N	Y	Y	N	N	N	N	Y	Y	Y	N	Y	N	Y	Y	Y	**11**
Skate Winter A	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	**1**
Skate Winter J	N	N	Y	N	N	N	N	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	Y	N	Y	Y	**9**
Tilefish A	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	**9**
Tilefish J	N	N	N	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	**6**
SUM	**0**	**0**	**5**	**3**	**2**	**6**	**0**	**2**	**2**	**2**	**6**	**2**	**0**	**0**	**0**	**5**	**5**	**6**	**2**	**5**	**5**	**4**	**6**	**7**	

Table 101 – Species with vulnerable EFH designations for ten-minute squares within Alternative 5C. (Presence = Y and absence = N)

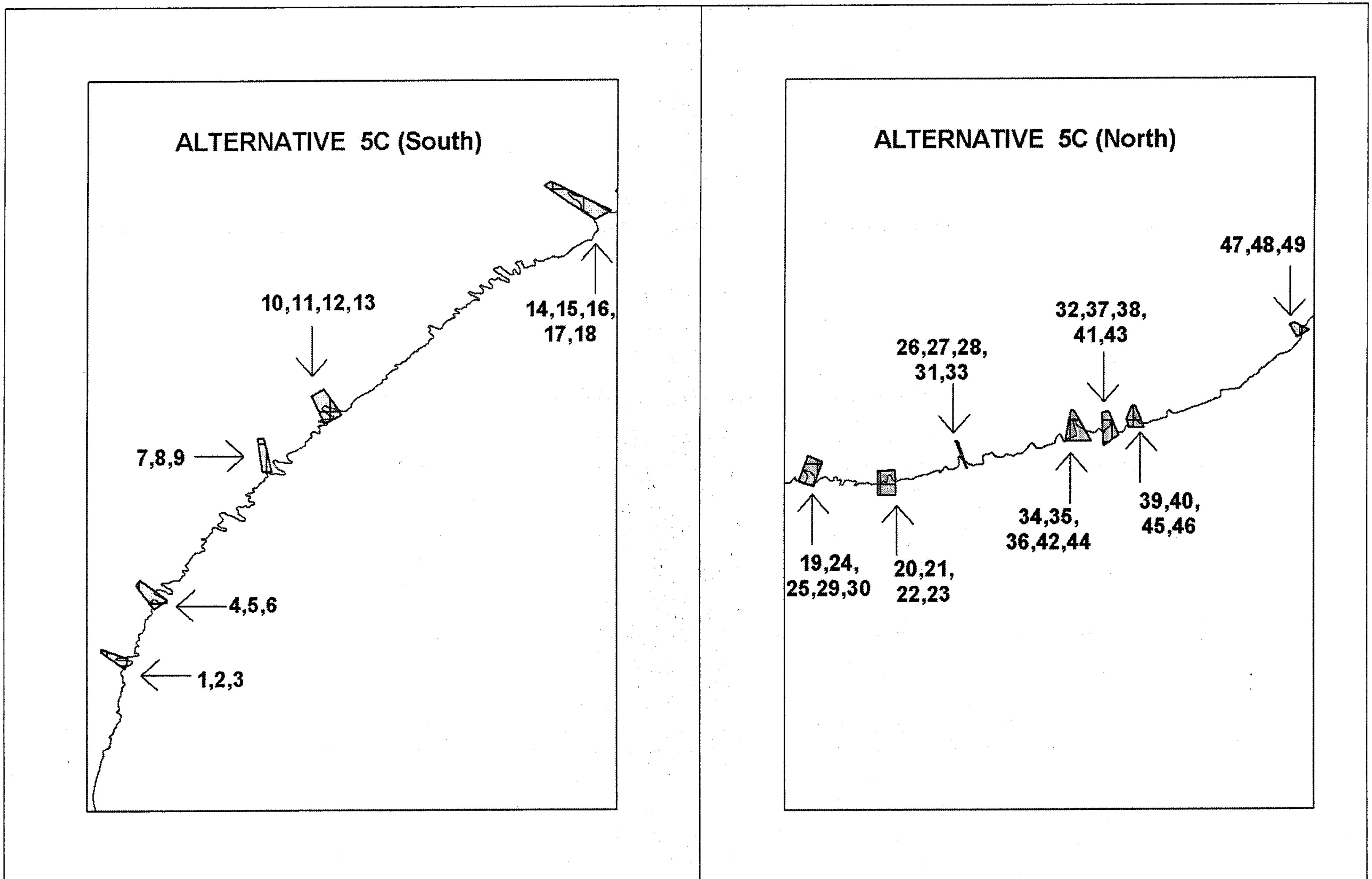


Figure 78 – Location of ten-minute squares with EFH designations for Alternative 5C (compare to Error! Reference source not found.)

6.3.1.5.4 Substrate within the deep-sea canyon areas

Substrate types within the deep-sea canyons were also evaluated. Section 5.1.6 describes the sediments in Oceanographer and Lydonia based on a variety of sampling techniques. Both Oceanographer and Lydonia Canyons have a mosaic of substrate types that are dependent on depth, currents, geology, relief, and biological activity. Corals are more abundant in Oceanographer Canyon than in Lydonia Canyon and substrates are more variable. In Oceanographer, shelf sediments are transported over the eastern rim of the canyon by the southwest drift and storm currents. Tidal currents and internal waves move sediments downcanyon along the axis and walls. The extensive exposure of outcrops (clay and boulders) indicates modern day erosional activities. The outcrops of clay and boulders are present on the canyon walls. Rippled, unconsolidated silt and sand are found along the canyon walls and in the axis. Large erratic boulders are present on the gently sloping upper canyon walls. Gravel up to cobble size forms a pavement throughout the northern part of the canyon and isolated patches are also found on the canyon walls and along the axis. The fauna within the heavily graveled area is sparse but diverse and is dominated by epibenthic invertebrates and fish

In Lydonia canyon, silty sediments are found on the walls and flanks of Lydonia Canyon and there are also sporadic rock outcrops. Rock outcrops are more common along the axis. There are rippled silty sediments in the axis of the canyon along most of its length. There are clay and rock outcrops on the west wall and flank of the canyon. Cobbles, pebbles, and shell hash are found above 400m on the east wall and flank. There is a good deal of erosion of sediments particularly along the axis. Most of the corals found in Lydonia Canyon are restricted to hard surfaces; the coral fauna is diverse and abundant.

Based on the information provided above, these two canyons contain some harder bottom types (rock and boulder outcrops, gravel and cobble, large boulders). The only spatial substrate data available for the entire Northwest Atlantic region are sediment data digitized by Poppe et al. These data were used to describe and compare the substrates believed to be found within the canyons. It is important to keep in mind that this digitized map is based on very few data points, and should be used in conjunction with the more descriptive information provided above from various sources, which have explored Oceangrapher and Lydonia Canyone, primarily in the 1960s and 1970s.

Substrate Data: Sediment data analyzed here were derived from digitized maps of sediment coverage (CONMAP) originally developed by Poppe et al. (1989, 1994) and made available on a CD-ROM by the U.S. Geological Survey (USGS 2000). Sediment coverages were inferred from point sample data based on depth changes. Very few samples were collected in offshore areas, especially in the canyons. This is the only comprehensive sediment database that is available for the entire Northeast region. Sediment types were originally classified into nine distinct grain size categories ranging from clay to bedrock. For simplicity, these nine sediment categories were condensed into six (based on a recommendation from the Habitat Technical Team). The six categories used for analysis are: bedrock, gravel, gravelly sand, sand, muddy sand, and mud. The substrate compositions of both closed area alternatives were determined.

Sediment Composition of Alternative 5AB and 5C

The sediment composition of both Alternative 5AB and 5C is depicted in Table 102. Alternative 5AB, the proposed action, is primarily muddy sand bottom (90%). Sand is reported in the shallower portions of the Lydonia Canyon closed area, while muddy sand is found in most of the Oceanographer Canyon closed area and in deeper waters of the Lydonia closed area (Figure 79). The division between muddy sand and sand is demarcated by the 100 fathom isobath (in most places). These data suggest that the majority of all the deep-sea canyons are comprised primarily of muddy sand, mud, and sand. The twelve closures in Alternative 5C contain 64% muddy sand and 31% mud (Table 102). Figure 80 depicts the substrate types in and around Alternative 5C (both maps). Substrate types contained within the deep-sea canyons based on the best available science were also evaluated. The data used are described in more detail in the paragraph below. In summary, the majority of the deep-sea canyons contain muddy sand, mud and sand, according to the data available. Section 5.1.6 describes the sediments found in Oceanographer and Lydonia in more detail and includes some harder bottom types.

Alternative	AREA (nm2)	Gravely Sand	Sand	Muddy Sand	Mud
5 AB (Proposed Action)	116	1%	7%	90%	2%
5 C	508	0%	5%	64%	31%

Table 102 – Sediment composition of Alternative 5AB and 5C (source: Poppe et al. 1989).

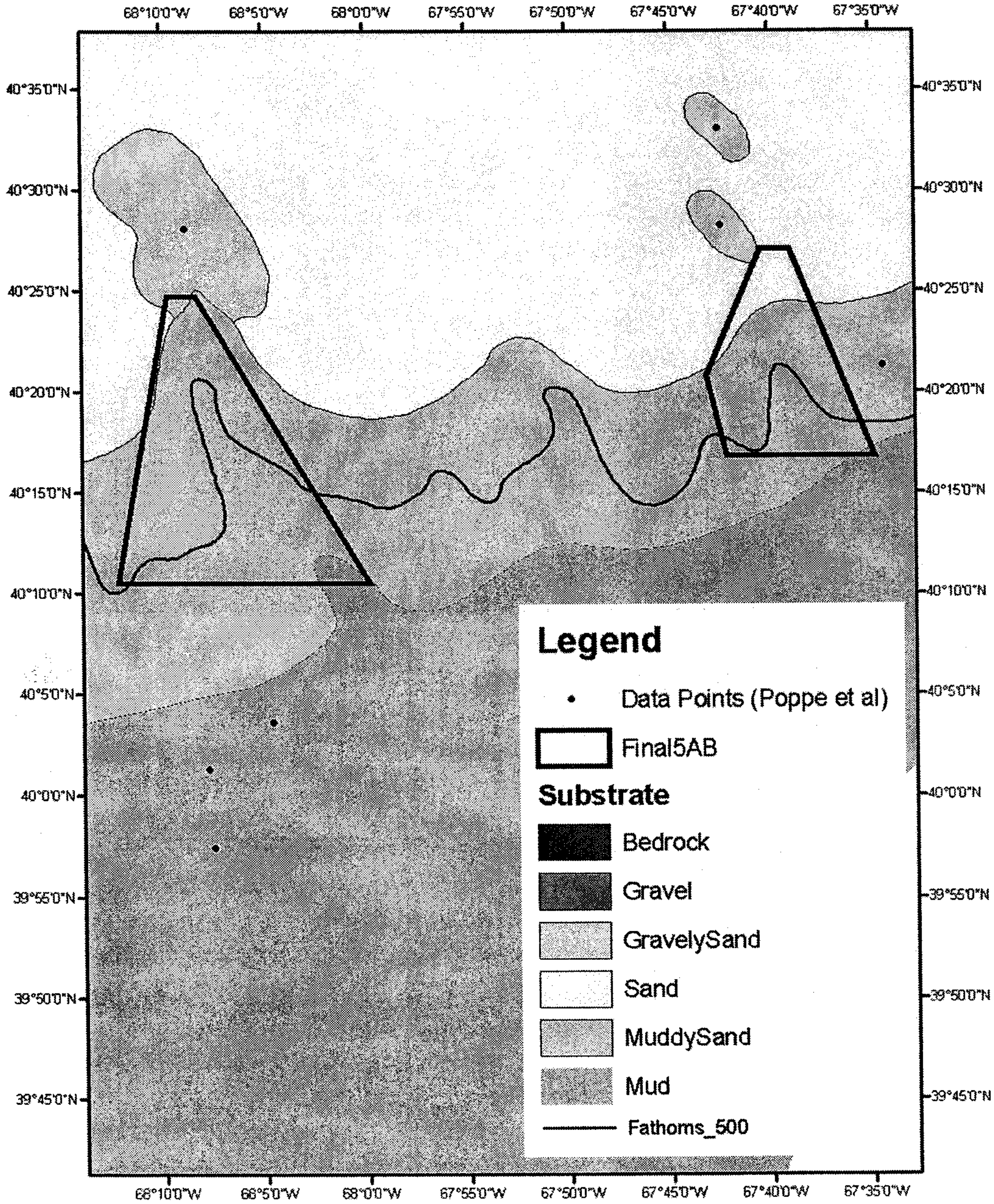


Figure 79 – Overlay of substrate type and Alternative 5AB (Proposed Action) (source Poppe et al 1989).

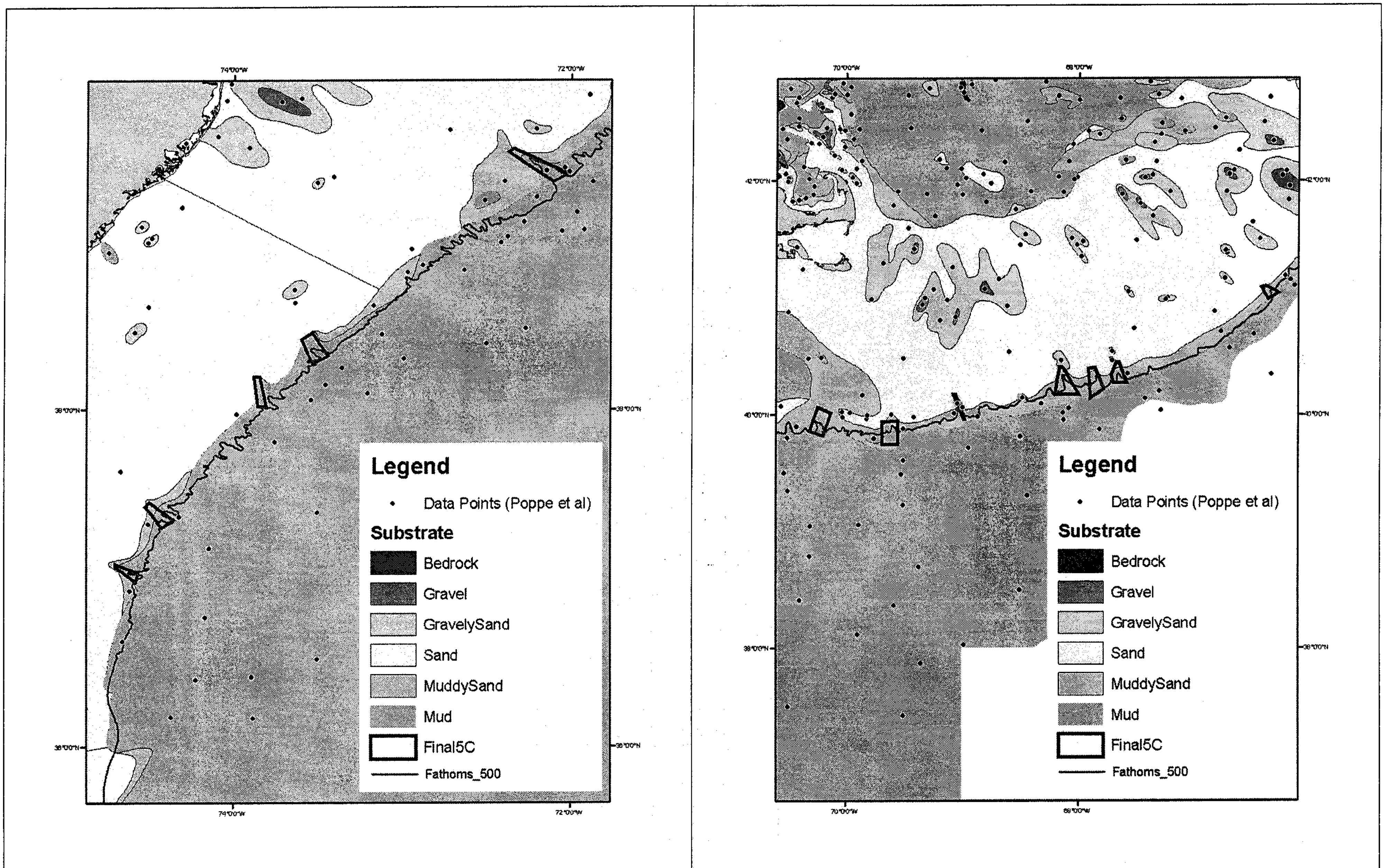


Figure 80 – Overlap of substrate type and Alternative 5C (based on Poppe et al 1989)

6.3.1.5.5 Presence of federally-managed species within the proposed Alternative 5AB closure

An analysis was conducted in order to determine which federally managed species and life stages occupy the proposed closed areas. A variety of sources were used in this analysis including submersible survey data, NMFS trawl survey data, data from a benthic sample database, and several key literature sources. Most of this analysis relies on reports and published studies using submersibles (Hecker et al. 1980, Valentine et al. 1980, Hecker et al. 1983, Cooper et al. 1987). Some of the submersible survey data, especially for schooling species, are based on occurrences (i. e., presence/absence rather than abundance estimates). The EFH source documents were also extensively used for information about the species in found within the proposed closure areas. See Reid et al. (1999) for the methods used to generate data presented in the EFH source documents.

The NMFS trawl survey database and the Wigley and Theroux benthic database (see Wigley and Theroux [1998] for methods) were queried for data within the closure coordinates. Trawl and benthic grab data from these areas were very limited, in part due to the difficulty of obtaining quantitative samples within the canyons. Obstructions to sampling in the canyons include fishing gear, steep walls, boulders, and great depths. The trawl survey database contained only one station (in Oceanographer Canyon, in 1968) within the closure coordinates and with a mean trawling depth >200m. Another five stations had trawls at least partly within the closure coordinates, and mean depths slightly <200m. In the Wigley and Theroux benthic database, there was only one record for areas within the closure coordinates.

Table 103 lists the federally managed species that were confirmed to occur at depths >200m in the Lydonia canyon closure, confirmed by data from submersibles and/or NMFS trawl survey data. There were four trawl stations within the Lydonia canyon closure from 1966-2001. Table 104 lists the federally managed species that were confirmed to occur at depths >200m within the Oceanographer canyon closure. Only two tows were within the boundaries of the Oceanographer canyon closure, one conducted in 1968 and one in 1997. While this data set is very limited, it is the best available data on the presence of federally-managed species within the proposed canyon closures.

Information about predator-prey interactions was limited due to the lack of specific data from the canyons. However, several prey species of the federally managed species found within the canyon closure areas were documented in the submersible data; specifically, quill worm, a prey species of red crab, and sea anemones, a prey species of tilefish.

Species	Observed in Submersible data	References	Observed in NMFS Trawl Data (Number and Biomass)	
Acadian redfish	Yes	Valentine et al 1980, Hecker et al. 1983, Shepard et al. 1986 Pikanowski et al. 1999	2	0.00
American plaice	No		2	0.50
Atlantic cod	No		1	7.70
Butterfish	No		8	0.70
Haddock	No		7	4.10
Little skate	No		2	1.30
Longfin inshore squid	No		91	7.40
N. shortfin squid	No		10	1.00
Ocean pout	No		66	28.10
Offshore hake	No		3	0.60
Pollock	Yes	Cooper et al. 1987, Cargnelli et al. 1999	5	2.70
Red crab	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 2001	No	
Red hake	Yes	Hecker et al. 1983, Cooper et al, 1987, Steimle et al. 1999	27	10.00
Silver hake	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 1999	183	15.00
Spiny dogfish	No		1	1.80
Tilefish	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 1999	No	
White hake	No		17	24.90
Winter skate	No		1	2.40
Witch flounder	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Cargnelli et at. 1999	3	1.20

Table 103 – Presence of federally-managed species in Lydonia Canyon (submersible and trawl data)

Species	Observed in Submersible data	References	Observed in NMFS Trawl Data (Number and Biomass)	
Acadian redfish	Yes	Valentine et al 1980, Hecker et al. 1983, Shepard et al. 1986, Pikanowski et al. 1999	No	
Barndoor skate	No		1	3.30
Butterfish	No		8	0.50
Little skate	No		2	0.50
Longfin squid	No		12	1.00
Offshore hake	No		1	0.50
Pollock	Yes	Cooper et al. 1987, Cargnelli et al. 1999	1	1.50
Red crab	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 2001. Valentine et al, 1980	No	
Red hake	Yes	Hecker et al. 1983, Cooper et al. 1987, Valentine et al. 1980, Steimel et al, 1999	18	4.20
Silver hake	Yes	Hecker, et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Valentine et al. 1980, Lock and Packer, 2004	35	4.80
Spiny dogfish	No		1	0.30
Thorny skate	No		1	0.00
Tilefish	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Steimle et al. 1999, Valentine et al. 1980	No	
Witch flounder	Yes	Hecker et al. 1980, Hecker et al. 1983, Cooper et al. 1987, Cargnelli et at. 1999, Valentine et al. 1980	No	

Table 104 – Presence of federally-managed species within Oceanographer canyon (submersible and trawl data)

This analysis shows that a number of federally-managed species occupy these areas. Benthic habitats for five of them (redfish, tilefish, barndoor skate, little skate, and winter skate) are designated as EFH within the two proposed closed areas. To some extent, redfish and tilefish inhabit hard bottom substrates that support coral and other types of attached epifauna (Table 85). Redfish aggregate in the vicinity of corals and other attached epifauna, utilizing them for shelter and perhaps preying on small organisms that are also associated with them (see Section XX). Damage or removal of corals and other species of attached epifauna by bottom trawls or gill nets would reduce the quality and/or quantity of EFH and therefore constitute an adverse impact.

6.3.1.5.6 Additional information about the proposed action to protect deep-sea canyon habitats

Additional information about the Lydonia and Oceanographer canyon closure areas is available based on preliminary research from a deepwater biodiversity cruise conducted by the Northeast Fisheries Science Center in May 2004. The cruise was taken in slope waters off Georges Bank, between Oceanographer and Munson canyons and in adjacent water depths of 400-1200m. The study utilized midwater and bottom trawls, hydroacoustics, and camera systems to assess biodiversity of fish and invertebrate assemblages in relation to habitat type. These data are preliminary and have not yet been audited; however, there is useful qualitative information that can be used in the meantime.

The midwater trawl used on the survey was an International Young Gadoid Pelagic Trawl (IYGPT).A standardized, roller rigged No. 36 Yankee bottom trawl with standard codend was also used. In addition to data for the primary organisms (fish) caught in the nets, catch data were also collected for invertebrate specimens.

Over 25 stations were sampled, and a handful of the stations were located within and around the proposed canyon closed areas. Figure 81 depicts the start location of all the tows from the survey, and Figure 82 depicts the start and end locations of all the tows that were within the proposed closed areas. These tows were very deep, so it is impossible to predict exactly when the tow reached the bottom, and where it actually began fishing.

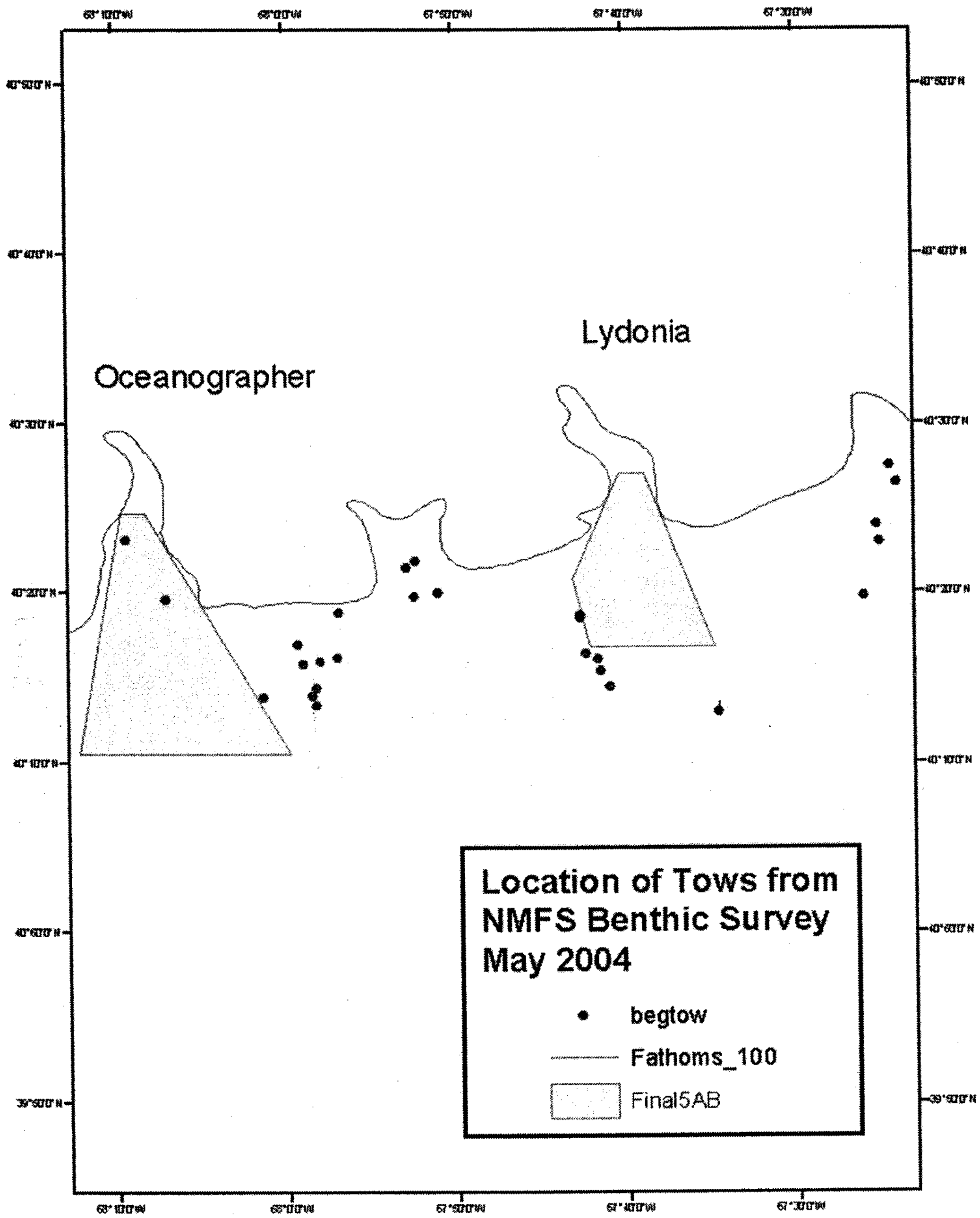


Figure 81 – Start location of survey stations from the May 2004 NEFCS Benthic Biodiversity Cruise (Conducted on the Delaware II May 17-28).

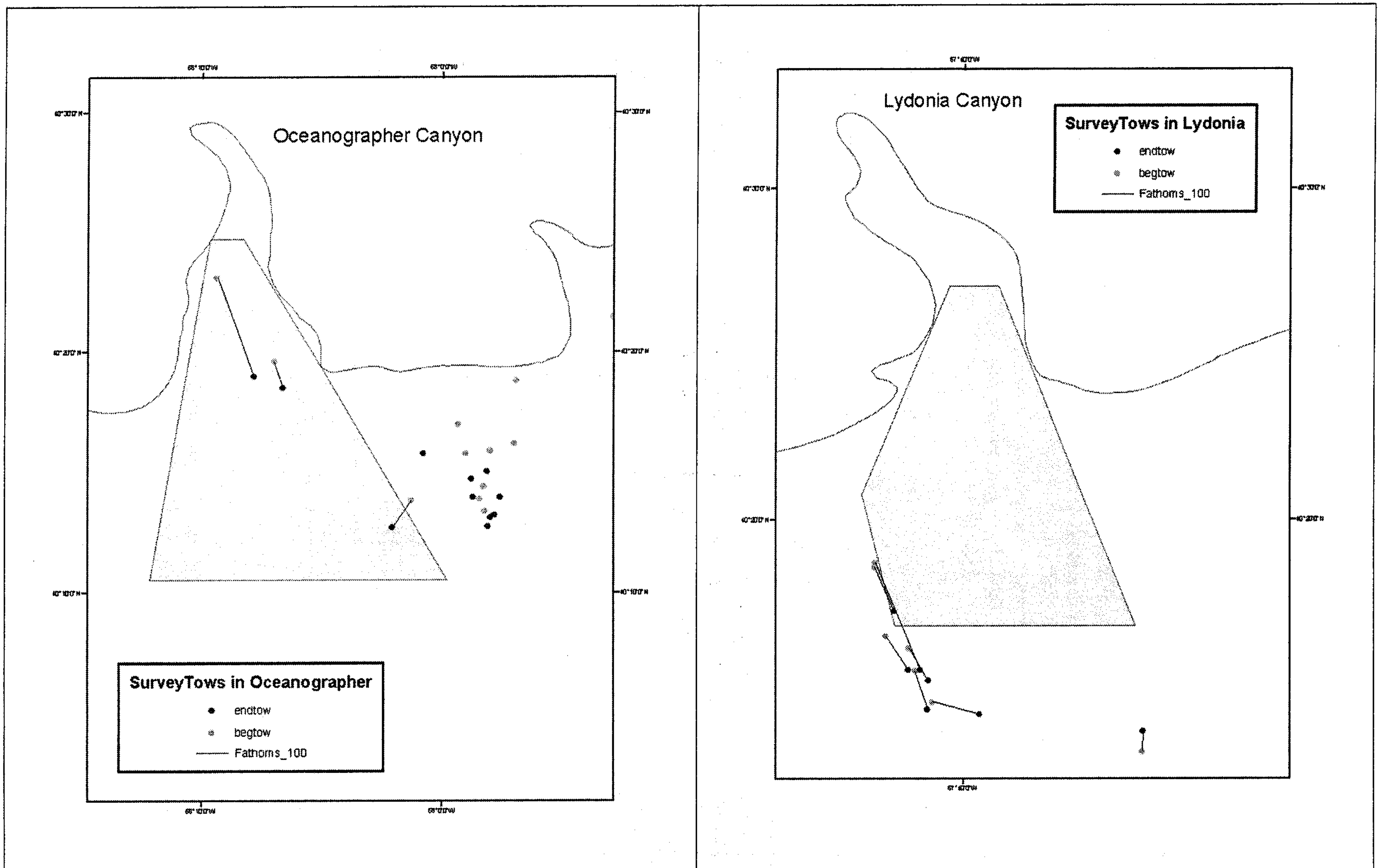


Figure 82 – Start and end locations of survey stations within the proposed canyon closure areas (Alternative 5AB) from the NEFSC Benthic Biodiversity cruise, May 2004.

On the three tows within Oceanographer Canyon, monkfish, witch flounder, and white hake were capured. Additional information was included related to other species found on these tows, specifically jellyfish, ctenophores (comb jellies), soft corals, and sea stars. The depth range for these three tows was 446 – 1053 meters. In Lydonia Canyon, two tows were made within the closed area, and several more in the areas around the closure. From the two tows within the canyon, a substantial number of monkfish, offshore hake, and thorny skates were caught, as well as other species. Based on the preliminary data from this survey, there is evidence that two more federally- managed species (monkfish and thorny skate) inhabit the proposed closed areas. EFH is designated for juvenile thorny skates within the closure (Table 100). According to the gear effects evaluation (Appendix 2 of this FSEIS), 4 of the 23 species with EFH considered to be vulnerable to bottom tending gears were found within the canyon closures based on these survey tows (witch flounder, white hake, thorny skate, and silver hake).

In summary, the data provided by the earlier trawl and submersible surveys and the 2004 offshore benthic survey support the conclusion that there are a number (24) of federally-managed fish species that occupy the closed areas that have been identified in the proposed action. Six of them have EFH that has been designated within these closures and is vulnerable to bottom tending gear. Benthic EFH for all six of them has been determined to be moderately or highly vulnerable to the effects of bottom trawling. One of them (juvenile redfish) is highly vulnerable due largely to the use of bottom structure (including corals) for shelter. Any reduction in the quality or quantity of EFH for these species within these two canyons would constitute a direct adverse habitat impact that would be prevented by the proposed action.

In general, the vulnerability of shallow-water habitats to the effects of bottom gill net fishing is low, but large corals in deep-water can easily be entangled by the nets and are thus highly vulnerable (see Section 5.4.1.7). Therefore, the habitat benefits that would result from the proposed action apply to bottom gill nets as well as bottom trawls.

Several of the other species that are found in the closed areas utilize deep-water gravel and other hard bottom habitats that support the growth of corals and other species of attached epifauna. Damage or loss of these organisms caused by monkfish trawls or gill nets would constitute an indirect adverse impact to benthic habitats that will be avoided by the implementation of the proposed closures. Protecting deep-water corals from damage or loss is especially critical given their very slow recovery rates (see Section 5.1.6).

Oceanographer (3 tows)		Lydonia (2 tows)	
Species	**Number of individuals**	**Species**	**Number of individuals**
Monkfish	6	Thorny skate	38
Witch flounder	4	Monkfish	10
White hake	1	Offshore hake	9
		Silver hake	8
		White hake	2
		Witch flounder	1

Table 105 – Summary of the number of species recorded on each survey tow within the two proposed canyon closure areas.

6.3.2 Other Alternatives considered in Amendment 2

6.3.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered two alternatives for de-coupling the DAS usage requirement, as described in Section 4.2.2.1. Based on public comment and concerns about increased fishing effort on monkfish and multispecies, the Councils rejected the proposals, and are taking no action. Under the no action alternative, Category C and D limited access vessels when on a monkfish DAS must also use either a multispecies or scallop DAS, depending on which other limited access permit the vessel holds.

Habitat Impacts

The two alternatives for de-coupling monkfish DAS from multispecies and scallop DAS usage requirements would allow vessels the choice, both annually and on a trip by trip basis, whether to use separated DAS or combined DAS. Whether or not a vessel would fish its monkfish DAS separately depends on the particular circumstances of the vessel, namely, area and gear fished, number of DAS or opportunity available in other fisheries, and other considerations. Vessels fishing in the NFMA, for example, whose multispecies DAS exceed its monkfish DAS, may find it more profitable to fish the multispecies DAS (with no monkfish trip limit) than to fish the monkfish DAS with no monkfish trip limit and the multispecies DAS with a monkfish incidental catch limit, even though the total number of DAS available to the vessel would be greater if the DAS were separated. As a result, there would be no increased effort under the DAS Alternative 1, and in fact effort may decline due to restrictions forthcoming in Amendment 13. The requirement to use a specific net while on a monkfish DAS, if adopted, is an additional factor that each vessel owner would have to consider in making the decision whether to de-couple DAS.

In the SFMA, where vessels can direct effort on monkfish and multispecies with far less overlap than in the NFMA, Category C and D may increase overall effort over the bottom compared to the status quo because they would have monkfish DAS *in addition* to their multispecies or scallop DAS, not *in combination with* their other DAS. Even if some NFMA vessels may elect to fish their monkfish only DAS in the SFMA, resulting in an increase in effort in that area, the habitat impacts would be minimal because the substrate type in the SFMA is primarily sandy bottom and less vulnerable to fishing impacts. While it is difficult to predict how many vessels would use the opportunity presented by Alternative 1, it is most likely that some scallop vessels will increase overall fishing time if DAS are decoupled. Under Alternative 1, those vessels could fish their entire scallop allocation on a full-time basis and then fish their monkfish DAS allocation. One limiting factor is that vessels will have to weigh the opportunity costs and the cost of re-rigging to use the monkfish trawl against the expected revenues.

If a significant number of scallop vessels targeted monkfish, overall effort levels would increase (unless, of course, scallop DAS were reduced under scallop management actions). These vessels generally operate in the SFMA, and as a consequence, the impacts to habitat of increased fishing effort will be less severe than in the NFMA due to the lower frequency of complex habitat types in the SFMA. Hence, whether this alternative would affect total bottom trawling time in the monkfish and/or groundfish fisheries is not clear.

If DAS transfer options result in the activation of latent effort, or unused DAS by trawl vessels, the impact of the fishery on EFH could be increased, depending on where and with what type of net the increased effort is used. Provisions to maintain conservation neutrality would mitigate this effect, however, as would trawl gear that is designed to minimize the effect of the fishery on EFH for some species.

Generally, there are a number of factors that will affect the speed and degree of habitat recovery in areas where bottom tending mobile gear use is reduced. These include: 1) the degree, duration, and extent of fishing in the area; 2) any other anthropogenic sources of habitat disturbance (e.g., contamination of bottom sediments in coastal waters); 3) the natural disturbance regime (e.g., frequency and intensity of storms, bottom currents, etc.); 4) the type of substrate or sediment; 5) depth; 6) the type of benthic organisms that inhabit the area; and 7) the length of time that the area remains undisturbed by fishing. Improvements in habitat quality would most likely occur in areas where trawling and dredging activity was minimal to begin with and is totally eliminated, or substantially reduced; in deeper, low-energy locations not exposed to storm events or strong bottom currents; in hard-bottom areas (in shallow or deep water) that support prolific growth of large, attached epifauna, or in other bottom habitat types that provide food and cover for demersal fish; and in areas populated by benthic organisms that grow faster and reproduce quickly. For some benthic environments that have been altered by fishing activity, complete recovery could take years. For others, recovery might only take a few months. If reductions in bottom trawling activity in marginal areas are temporary and increase after a year or two as stock abundance increases, habitat recovery in certain areas may never be complete.

A useful conceptual model for understanding the relationship between changes in fishing effort and the degree of habitat modification described in the National Research Council report on trawling and dredging effects (NRC 2002). Starting from zero fishing effort with no habitat impact, a change in fishing effort will change the degree of habitat modification, but as effort continues to increase habitat alteration reaches its maximum point and levels off even as effort continues to increase. For heavily modified habitats exposed to high levels of fishing activity, effort must be reduced substantially before any improvement in habitat quality is realized. Although there is much uncertainty regarding the relationship between fishing effort and habitat alteration at low effort levels, it is probably not linear as depicted in NRC 2002. A more realistic relationship, at least for certain habitats exposed to mobile bottom-tending gear, is curvilinear since the first few tows in an undisturbed habitat would be expected to produce the greatest relative change in habitat conditions (e.g. three-dimensional structure), with reduced effects as fishing effort increases to the point of maximum habitat modification. In this scenario, reductions in effort would have to be even more severe (approaching zero effort) in order to achieve, say, a 50% habitat recovery.

Most of the available studies of gear effects for mobile gear types used in the Northeast region examine the effects of single or multiple tows in previously fished or un-fished locations within some defined time period, with control plots in nearby undisturbed locations. There are a few studies that compare benthic communities or physical habitat features in areas exposed historically to different levels of fishing effort. One of them (Frid et al. 1999) compared periods of low, medium, and high otter trawling activity at two sites in the North Sea over a 27-year period. At the heavily-fished, mud-bottom, site, benthic organisms that were predicted to increase as fishing effort did increase in abundance, but organisms that were expected to decrease in abundance did not. At the lightly fished, sand-bottom site, there was a correlation with primary production, but no correlation with fishing effort. In a similar study, Kaiser et al. (2000b) compared benthic communities exposed to high, medium, and low fishing intensity by otter trawls, beam trawls, toothed scallop dredges, and lobster pots in the English Channel (sand substrate) and found no significant effects of increased effort on the numbers of benthic organisms or species, but did find reductions in the abundance of larger, less mobile, emergent epifauna and increased abundance of more mobile invertebrate species, fewer larger organisms, and more smaller organisms in high effort areas. Two factors that complicate this kind of research are the effects of different habitat conditions (e.g., depth, sediment type) that may exist at low and high-effort sites, and temporal changes in environmental conditions (e.g., changes in sediment composition or water temperatures) that occur over the time period being investigated.

More direct evidence of the effects of changes in bottom fishing effort is provided by studies that relate progressive increases in disturbance to changes in benthic community structure and seafloor topography and sediment composition. Jennings et al. (2001) documented effects of increasing beam trawling activity on sand and muddy sand-bottom communities in the North Sea. Thrush et al. (1998) did the same for 18 stations (mud and sand bottom) in Hauraki Gulf, New Zealand, that were fished at varying levels of effort by otter trawls, Danish seines, and toothed scallop dredges. Unfortunately, these studies examine the combined effects of a number of gear types, including toothed scallop dredges and beam trawls that are not used in the Northeast region of the U.S. Nevertheless, a number of significant impacts to benthic communities are identified which can probably, to some extent, be generalized to dredging and otter trawling on similar habitat types in the Northeast region. These included decreased infaunal and epifaunal biomass (North Sea), decreased densities of large epifauna, echinoderms, and long-lived surface dwellers, and increased densities of small, opportunistic species (New Zealand).

There are three experimental studies of the habitat effects of increasing otter trawling effort in commercially un-exploited areas. Two of these were performed in mud-bottom habitats, one in Sweden (Hansson et al. 2000) and the other in Scotland (Tuck et al. 1998). Another (Moran and Stephenson 2000) was conducted in Australia on sandy substrate. In the Swedish study, two tows were made per week for a year in an area closed to fishing for six years. During the last six months of the experiment, 61% of the infaunal species were negatively affected (i.e., they decreased more or increased less in the trawled sites compared to the control sites), and there were significant reductions in brittle stars (compared to a control area), but not in polychaetes, amphipods, or mollusks. In the Scottish study, multiple tows were made during a single day for 16 consecutive months in an area closed to fishing for more than 25 years. Increased bottom trawling produced door tracks, increased bottom roughness, but had no effect on sediment composition. There were significant increases in the number of infaunal species after 16 months of disturbance, but no changes in biomass or total number of individuals; community structure, however, was altered after five months and community diversity declined six months after trawling ceased. Effects on species groups varied: polychaetes increased in abundance while bivalves decreased in abundance five months after trawling began. In the Australian study, four tows made at 2-day intervals on the same area of bottom. Underwater video surveys showed that the first tow reduced the density of large (>20 cm) benthic organisms by 15% and four tows by 50%. Sainsbury et al. (1997), working in the same general area, reported that a single pass of a trawl footrope removed 89% of sponges larger than 15 cm.

Although there is some information (summarized above) that documents habitat modifications that result from increasing fishing effort by mobile bottom-tending gear, there is no corresponding evidence of the effects of progressive reductions in fishing effort on benthic marine habitats. There are, however, a number of studies that document the recovery of benthic habitats following the cessation of bottom fishing. These have been performed in areas that have been closed to various types of fishing activity, mostly by mobile bottom-tending gear. Tuck et al. (1998) monitored the recovery of a mud-bottom benthic habitat for 18 months in a closed area in Scotland after 16 months of bottom trawling and found that door tracks were still visible after 18 months, and that the infaunal community had recovered completely within the same period. This is the only directed study of recovery from simulated commercial trawling activity that has been conducted. Other observations have been made by a number of authors who have monitored the recovery of benthic habitats from single trawl or dredge tows, or following multiple tows in a single day (see section 9.3.2). Kenchington et al. (2001) did note that infaunal organisms that were reduced in abundance during one of three years of experimental fishing in a closed area on the Grand Banks had recovered by the time experimental fishing resumed a year later and Schwinghamer et al. (1998), working on the same project, noted that door tracks lasted up to a year and seafloor topography recovered within a year's time. Sainsbury et al. (1997) compared historical survey data – collected before and after commercial fishing started – to data collected in an area in Australia that remained open to trawling and another area that was closed for five years and reported increased catch rates of fish associated with large epifauna and small benthic epifaunal organisms (but not large ones) within the five-year period.

6.3.2.2 Trip limits for incidental catch

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs. The proposed increase is intended to reduce discards of monkfish by allowing specified vessels, including general category scallop and clam dredge boats (under a proposal adopted in this amendment), to retain rather than discard small amounts monkfish caught incidentally.

Habitat Impacts

Trip and possession limits may alter fishing effort on particular stocks and, consequently, in particular geographic areas or areas of specific bottom sediments. The impact of increasing trip or possession limits on fishing behavior, however, depends in large part on the magnitude of the limit relative to other species caught, particularly target species. In the case of the proposed alternatives, which address low incidental catch allowances, the amount of monkfish that vessels can retain under any of the alternatives is insignificant in comparison to the quantity and value of the target species, and are unlikely to affect the distribution or magnitude of fishing effort and its effect on EFH.

6.3.2.3 Minimum mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). That would be 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net under Alternative 2, and 12-inch square mesh in the codend under Alternative 3. If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

Habitat Impacts

Use of a larger mesh in the codend of monkfish trawls will reduce bycatch and allow for the escape and survival of some benthic organisms that would otherwise be brought aboard the vessel and die. This is expected to improve bottom habitat conditions in trawled areas by increasing the abundance and diversity of benthic communities. In addition, increasing mesh size may reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species. To the extent that the increased mesh allows escapement of legal sized or marketable monkfish, vessels may increase the amount of time the gear is on the bottom necessary to catch an equivalent amount of monkfish. Selectivity data on 12-inch mesh for monkfish, however, is not available, and it is unknown how much catches of marketable monkfish would be reduced.

6.3.2.4 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 11-inch or 10-inch minimum tail size (Alternative 2, Options 1 and 2, adopted Option 1), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. None of these alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch.

Habitat Impacts

A reduction in, or the elimination of a minimum size requirement, will result in vessels reaching their trip limits sooner because they could keep more fish brought up in the nets, and, therefore, will reduce trip time on directed monkfish trips. Total bottom time, however, may not be affected if vessels make more trips. An increase in minimum size (Alternative 4), along with the increased minimum mesh size could result in vessels fishing longer to catch the same total weight of monkfish. In general, it is unlikely that changes to the minimum fish size will have a significant effect on total fishing effort by bottom trawl vessels in the directed monkfish and groundfish fisheries.

6.3.2.5 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (2 20-day blocks).

Habitat Impacts

Requiring a vessel take 20 or 40 days out of the fishery would reduce trawling effects on benthic habitats for such a short period of time that it is not likely to have any measurable effect. For the same reason, eliminating the requirement (proposed action) will not have any effect on habitat.

6.3.2.6 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

Habitat Impacts

This program could affect deep-sea benthic habitats on the edge of the continental shelf by enabling vessels to return to areas where they have not been able to fish profitably since the implementation of the FMP. However, it must be noted that the offshore fishery program also requires the use of 6" inch roller gear, which may reduce the disturbance level of complex or high relief bottom habitats, and limits the ability of trawl vessels to fish in those areas. Additionally, because the DAS allocated to participating vessels will be pro-rated to account for the increased trip limit, the overall effort of the fishery might be reduced. However, data and models to accurately predict the mitigating effects of these requirements are unavailable.

Historically, fishing for monkfish with trawls and gillnets took place in offshore waters on the edge of the continental slope, near the heads of several deepwater canyons. Deep-sea corals are known to exist in the submarine canyons in this region and provide hard structure that in turn provides ecological services to many of the Councils' managed species. Therefore, the re-establishment of an offshore directed monkfish trawl fishery may increase the probability of fishing effort near these deepwater canyons, which could increase interactions with deep-sea corals. The monkfish fishery is one of the few fisheries that operate in deepwater, and this offshore fleet is more equipped to explore these areas. Damage to these areas may indirectly and adversely impact the EFH. Managed species with EFH including waters deeper than 200 meters and containing hard substrate include pollock, redfish, whiting (silver hake), clearnose skate and tilefish. A number of habitat management alternatives in this amendment are designed to protect these deep-sea canyon communities from the adverse effects of fishing (see Section 4.1.8)

According to the Red Crab FMP, red crabs are patchily distributed along the continental shelf between 200 and 1800 meters. The EFH of red crab (all life stages) is depicted in Figure 83, along with directed monkfish trawl effort. There is some overlap, especially in the shallower portion of overall red crab EFH, which begins around 200 meters. However, due to red crab opportunistic feeding habits, the vulnerability of adult and juvenile red crab EFH to otter trawls was characterized as "low". Red crab larvae are pelagic, and red crab eggs live within the female carapace, thus the vulnerability to otter trawling is not applicable for these life stages. Therefore, adverse impacts to red crab EFH at any life stage by the monkfish fishery are not occurring because a "moderate" or "high" vulnerability ranking is needed to meet the threshold (see Appendix II).

The proposed offshore monkfish trawl fishery will most likely be prosecuted in waters near or within areas designated as tilefish EFH. The tilefish HAPC was designated as an area important for tilefish in 2001. In fishing year 1999, approximately 19% of the directed monkfish trawl fleet fished within the boundaries of the tilefish HAPC according to locations provided by fishermen in the vessel trip report database (See Figure 84). There are several pieces of information that may or may not conclude that bottom-tending mobile gear has an adverse impact to tilefish EFH that is more than minimal and temporary in nature. The Gear Effects workshop (NREFHSC, 2002) indicated that tilefish EFH, particularly the pueblo village structures, is vulnerable to bottom-trawling. A MAFMC funded report (Able and Muzeni) concludes, based upon a limited review of video tapes of submersible dives, that there is no evidence that otter trawls adversely impact tilefish burrows through sedimentation. Lastly, the NEFMCs gear effects evaluation ranks tilefish EFH as vulnerable to otter trawling based upon the potential adverse impacts to habitat components other than structure such as impacts to food sources, impacts to reproduction, and impacts to non-burrow structures. In fishing year 2001, only 3% of all directed monkfish trawl trips were taken within the tilefish HAPC (See Figure 84).

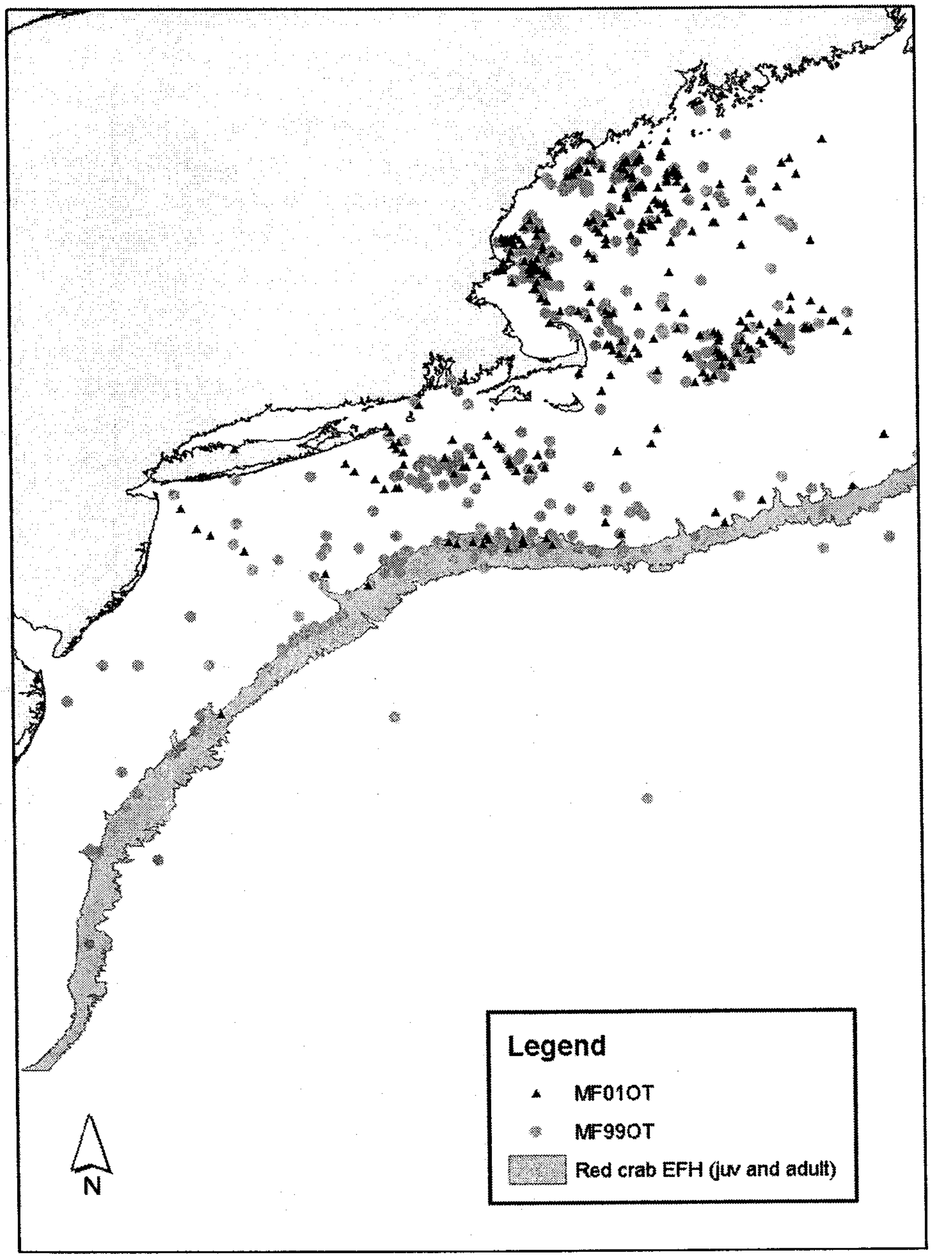


Figure 83 EFH for all life stages of Red crab with directed monkfish trawl effort from fishing years 1999 and 2001

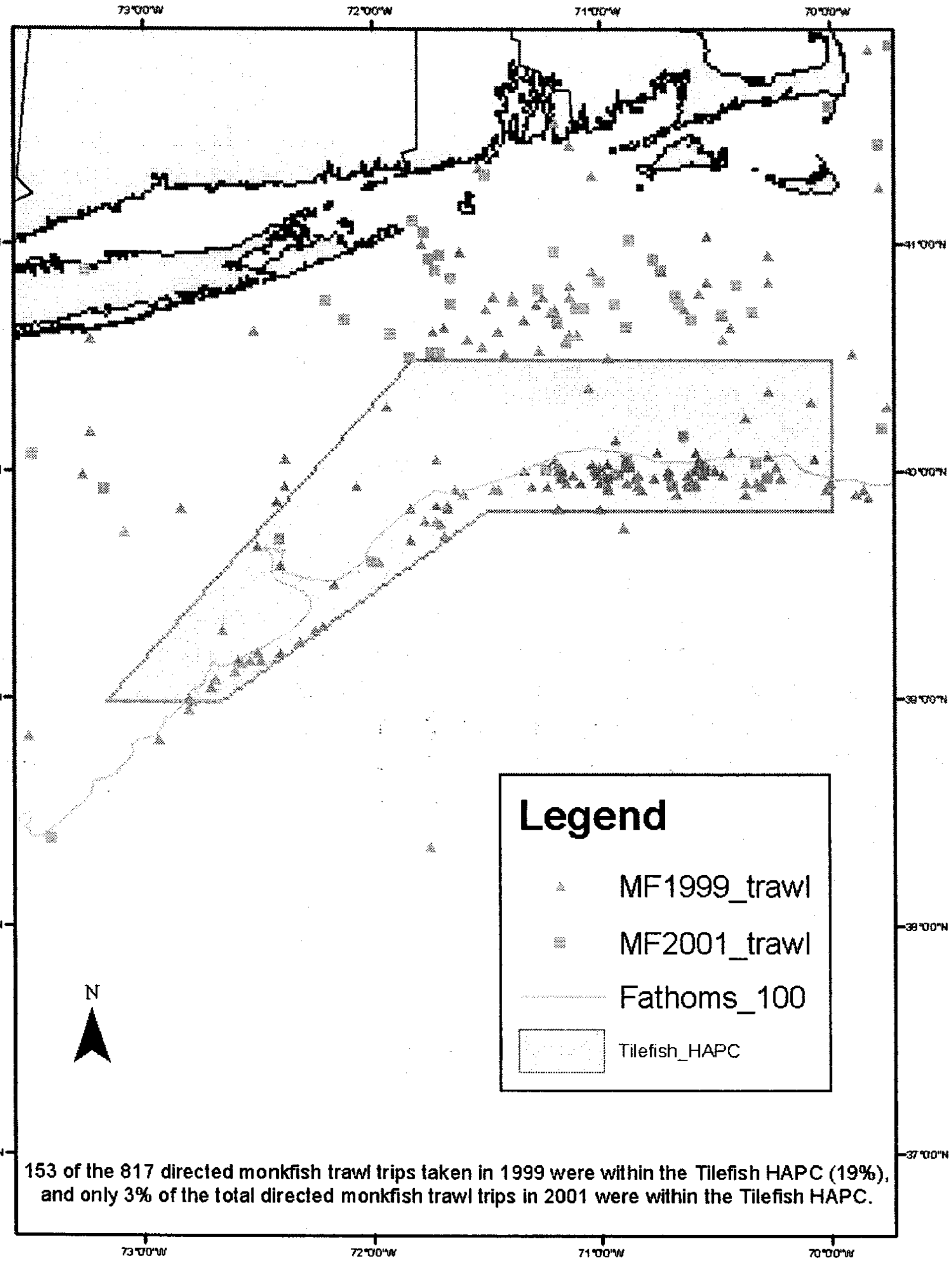


Figure 84 Distribution of directed monkfish trawl effort within the tilefish HAPC for fishing years 1999 and 2001.

6.3.2.7 Modification of permit qualification for south of 38°N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

Habitat Impacts

The proposal to modify the permit qualification criteria for vessels fishing south of 38°00'N could result in up to 5 new vessels entering the fishery, pending any appeals. The monkfish fishery in that area, however, is a large-mesh gillnet fishery that has minimal impact on bottom habitats. Even if some of those vessels were to convert to trawl gear, the number of new vessels, compared to the total number of monkfish permits is small, and the impact on sandy bottom habitat in the area would be insignificant.

6.3.2.8 Modifications to the framework adjustment procedure

The Councils propose three additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6). They are implementation of: 1) transferable monkfish only DAS (sale or lease); 2) measures to minimize fishery impact on protected species, including sea turtles; and 3) bycatch reduction devices.

Habitat Impacts

Since the proposed action is strictly administrative at this point (enabling future regulatory action through the framework adjustment procedure) there are no direct habitat impacts of the proposed measures. If, and when the Councils propose to take action under the framework procedure, the impacts of specific measures would be analyzed and discussed in the accompanying environmental impact documents.

6.3.2.9 Exemption program for vessels fishing outside of the EEZ (in the NAFO Regulated Area)

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7).

Habitat Impacts

None of the proposed measures are expected to affect EFH.

6.3.2.10 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research. Under Alternative 3, no action, vessels that want to participate in cooperative research must either submit an experimental fishery permit application or respond to a NMFS Request for Proposals.

The research that could be conducted under either of these programs includes, but is not limited to: research to minimize bycatch; research to minimize impacts of the fishery on EFH or other sensitive habitats; research or experimental fisheries for the purposes of establishing a trawl exempted fishery under the multispecies FMP in the NFMA; research on the biology or population structure and dynamics of monkfish; cooperative surveys; and gear efficiency.

Habitat Impacts

These alternatives, to the extent that they are focused on research to minimize impacts of the fishery on EFH or other sensitive habitats, will result in an increased knowledge of fishing impacts on EFH, and the development of measures to minimize the impact of the fishery on EFH. Both are expected to have neutral direct effects on habitat because they do not result in increased effort. Because the maximum number of DAS available under these programs would not exceed 500, and since those DAS would be subtracted from the overall allocation to vessels, the potential impact to habitat is minimal.

6.3.2.11 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

Habitat Impacts

While increases in vessel size and horsepower could affect the vessel's impact on EFH by enabling it to fish in more areas, to fish in deeper water, and on more hard bottom, this proposal will not likely impact EFH because the upgrading provision will only equalize two existing baselines, not increase the overall baseline.

6.3.2.12 NFMA Monkfish trawl experimental fishery

The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS.

Habitat Impacts

The proposed experimental fishery would not have a direct impact on habitat, compared to no action, since vessels can conduct such experimental fisheries without the Councils adopting this alternative, and, in fact, such an experiment is currently being done. Indirectly, however, the trawl experimental fishery could reduce the monkfish fishery's impact on habitat, if the resulting experiments were successful and followed-up with establishment of appropriate gear requirements. As noted, however, such experiments can take place without the adoption of this alternative.

6.3.2.13 Change fishing year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) considered but rejected three alternatives for changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively. Alternative 1 is the no action alternative.

Habitat Impacts

This is an administrative action and, therefore, these alternatives do not have any habitat impact compared to taking no action.

6.3.3 Practicability analysis

The legal EFH provisions state that each FMP shall identify and "minimize to the extent practicable adverse effects on such habitat caused by fishing." In this context "practicable" was interpreted to mean "reasonable and capable of being done in light of available technology and economic considerations."

The EFH regulations at 50 CFR 600.815(a)(2)(iii) provide guidance on evaluating the practicability of management measures:

"In evaluating the practicability of the identified habitat management measures, Council should consider the nature and extent of the adverse effect on EFH and the long and short-term costs and benefits of potential management measures to EFH, associated fisheries and the nation consistent with national standard 7. In determining whether management measures are practicable, Councils are not required to perform a formal cost/benefit analysis."

A practicability analysis of EFH measures in a fisheries management plan is supposed to weigh the economic and social costs (and benefits) against the benefits to habitat of EFH protections. However, the ecological costs and benefits (of taking or not taking action) are substantially harder to evaluate. In essence, the benefits of specific actions to protect or restore habitat are not all readily quantifiable in the same units as the costs (dollars). It is therefore very difficult to make direct quantitative comparisons and hence give specific quantified answers to questions of practicability. This is in part due to uncertainty in the direct effects of fishing gears on habitat function and the lack of information on the relationships between habitat function and the productivity of managed and non-managed species. This uncertainty and lack of information is both a consequence of and exacerbated by the complexities of the ecological relationships and processes involved.

This practicability analysis follows concepts and text provided in the Gulf of Mexico Fishery

Management Council's Generic Essential Fish Habitat EIS (2003).

6.3.3.1 Assessing Practicability with Limited Information – Approach

NMFS has not identified a preferred methodology for conducting the practicability analysis. Therefore, a strawman approach, combining habitat, economic, and social analysis of the habitat alternatives to determine their overall practicability, is presented here. The habitat alternatives are primarily analyzed in a qualitative manner. This analysis synthesizes some of the conclusions from the habitat analysis, the socio-economic impact analysis, the biological and ecological impacts, as well as issues such as compliance with National Standards or MSA in general that are described in other parts of the document.

Four primary components have been extracted from the full analysis to help determine the practicability of the alternatives. Each component is briefly described in the sections below (see Table 106).

This FSEIS uses specific practicability factors relevant to the EFH Final rule requirements to evaluate if the action is reasonable and capable of being done in light of available technology and economic considerations, and will not impose unreasonable burden on the fishery. The practicability factors used are qualitatively discussed in the relevant consequence sections as follows and summarized in the Summary of Practicability section.

Practicability Factor	Relevance to 50 CFR 600.815(a)(2(iii)	Description
Net economic change to fishery	The long and short-term costs and benefits of potential management measures to: associated fisheries the nation	Industry-level impacts to groundfish, scallop, monkfish and other fisheries
Equity of potential costs among communities	The long and short-term costs and benefits of potential management measures to: fishing communities	Short-term impacts on coastal subregions
Differences in EFH Value	The nature and extent of the adverse impact on EFH and the long and short-term costs and benefits of potential management measures to: EFH (direct impacts)	Directionality of change in amount and type of area, vulnerable or adversely impacted EFH and complex sediment types
Population effects and ecosystem changes	The long and short-term costs and benefits of potential management measures to: EFH (indirect impacts)	Directionality of change in amount and type of important species guilds and species assemblages as indicated by analysis

Table 106 Description of factors used in the EFH practicability analysis

According to information included and evaluated in this FSEIS (see Gear Effects Evaluation, Vulnerability of EFH to Bottom-Tending Fishing Gears, and Adverse Impact Determination Sections), there is some understanding in the Northeast U.S. that a relationship exists between fishing gear and effort and effects on habitat. For some species, there is also some understanding of the links between exploited populations and habitat in terms of ecological functions. However, there is little or no understanding of these links in terms of productivity and the specific effects of habitat degradation, past, present and future, on the productivity of managed species. According to a provisional framework outlined in Auster (2001), it would seem that the types of management measures needed for preventing, mitigating, or minimizing adverse effects of fishing on EFH are a mixture of preventative/corrective and the precautionary approach. The types of actions the author suggests under these categories are as follows:

Preventative approach: restrict effort or gear or use no-take marine protected areas (MPAs) to minimize effects of particular gear types on particular habitats.

Corrective approach: Adjust boundaries or change management measures on the basis of data on habitat recovery and links to population dynamics.

Precautionary approach: Designate no-take MPAs to protect long-lived and sensitive species in areas that do or potentially contain such taxa.

The New England Fishery Management Council will be considering similar issues and approaches in the upcoming Omnibus Habitat Amendment #2.

6.3.3.1.1 Net economic change to fishery

A summary on a fishery-by-fishery basis is not possible, in part, because the impacts are negligible and because the analysis applies only to directed monkfish trips. As such, the impact will be limited to monkfish fisheries. Scallop fisheries are unaffected because the closures apply only to vessels on a monkfish DAS which cannot be used in combination with a scallop DAS.

6.3.3.1.2 Equity of potential costs among communities

See Social Impact Assessment of Alternatives to Minimize Adverse Effects of Fishing on EFH Section for a more detailed look at the impacts to ports and vessel characteristic classes (Section 6.5.5.8).

6.3.3.1.3 Differences in EFH Value Between Alternatives / Population effects and ecosystem values

The "preventative approach" of restricting effort or gear is utilized to minimize effects of the directed monkfish fishery on vulnerable habitats.

6.3.3.2 Assessing Practicability with Limited Information – Results

6.3.3.3 Alternative 1

Net economic change to fishery / Equity of potential costs among communities – Taking No Action would impose no immediate term economic impacts on fishery participants. The longer term impact is not known as quantifiable links between habitat and productivity of the monkfish resource has not been established. Should these links prove to be significant, then taking no action would have a longer term deleterious impact on the net value of the monkfish fishery.

Differences in EFH Value / Population effects and ecosystem changes- This alternative does not contain any specific measures to minimize adverse effects on EFH. However, it should be noted that the status quo groundfish closed areas will remain intact and will provide substantial habitat protection for vulnerable habitat types. However, the primary mitigation tool employed to minimize the adverse effects of EFH that are more than minimal and less than temporary in nature are the network of Habitat Closed Areas. With that said, there are net benefits to habitat under the current management measures that have been implemented by the monkfish, groundfish and scallop fishery management plans. Refer to Table 107 for a list of management measures that are part of the Status Quo for fisheries management of the stocks in the Northeastern U.S. as well as a brief description of their habitat impacts.

Overall, this alternative is practicable.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Closed season or time out of the fishery	Monkfish	Multispecies vessels (Monkfish Category C and D) are required to take 20 days out of the fishery during March 1 to May 31 each calendar year. Monkfish Category A and B vessels are required to take 20 days out of the fishery April 1 through June 30 each calendar year. Scallop vessels with a Category C and D permit are not required to take time out of the fishery.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Authorized fishery programs	Monkfish	5. Offshore SFMA Fishery - Under current regulations, vessels fishing in the offshore areas of the SFMA are subject to the same DAS, trip limit, and gear regulations that apply to vessels fishing in inshore areas. 6. Permit qualification criteria may be revised with the effect of increasing the number of permits by 3-7. Vessels permitted under this program would be restricted to fishing south of 38°N.	5. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries. 6. Under no action, vessels are not permitted to fish in the EEZ and are, therefore, restricted to fishing in state waters. While this concentration of effort in nearshore areas could have negative habitat consequences if the vessels used mobile gear, but they currently only fish with gillnets, and are likely to continue doing so in the future, with no significant habitat effect.	**0**
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. Addition of Cashes as a year round closure	Year-round closures provide habitat benefits to the areas within the closures. The addition of Cashes Ledge as a year-round closure will benefit EFH. Rare kelp beds are found in that area.	**+**
Habitat Closed Areas	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	**+**

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravelly sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected scenarios (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	+
		EFFORT REDUCTION MEASURES		
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Monkfish	Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously	This alternative relies on the scallop and multispecies management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	+
Trip limits for incidental catch	Monkfish	7. 50 lbs. (tails) per trip. 8. General category scallop vessels fishing with a dredge (that is, not on a DAS) and clam dredge vessels are prohibited from retaining any incidentally caught monkfish. 9. The area east of 74°00' is under the larger multispecies minimum mesh, and vessels fishing for fluke west of 72°30' and east of 74°00 went from a monkfish incidental catch limit of 5 percent of total weight of fish on board to 50 pounds (tails) per trip	7. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the small mesh multispecies, multispecies, fluke and other, exempted, fisheries. 8. This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the general category scallop and surf clam/ocean quahog fisheries. 9. This measure may reduce allowable landings for large mesh multispecies vessels fishing between 72°30' and 74°00', but is not likely to alter the duration or intensity of fishing effort beyond that already experienced as a result of the large mesh multispecies fishery.	0
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	Mix of adaptive and phased effort reduction strategies. A days (60% of effective effort)	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
		B days (40% of effective effort) C days (FY01 allocation). Provides opportunity to fish on stocks that do not need rebuilding.		
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	+
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this provision cannot be sold.	+
GEAR MODIFICATION MEASURES				
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	+
Minimum fish size	Monkfish	The current regulations apply different minimum sizes in the NFMA and SFMA, as follows: **NFMA:** 11 inches (tail) or 17 inches (whole) **SFMA:** 14 inches (tail) or 21 inches (whole)	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
NFMA Monkfish trawl experimental fishery	Monkfish	No monkfish trawl exempted fishery in the NFMA	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	0
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
			rates and increase bottom time in areas where medium-small sized scallops are prevalent.	
Ten inch twine tops	Scallop	As of May 1, 2004, all scallop dredges with limited access or general category permits are required to have twine tops with no less than 10inches.	Ten-inch twine tops will reduce by-catch, no direct habitat effects.	**0**
		OTHER MEASURES		
Exemption program for vessels fishing outside of the EEZ (in the NAFO Regulated Area)	Monkfish	Under current regulations, a fishing vessel landing monkfish in U.S. ports is subject to all of the regulations of the FMP, including permits, DAS, trip limits and other measures. These regulations apply even if the monkfish are caught outside of the EEZ.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Clarification of vessel baseline history	Monkfish	Vessels that had another federal fishery permit and upgraded or downsized length, horsepower or tonnage prior to getting a monkfish permit have two different upgrading baselines.	It is unclear how this measure could impact EFH. While the potential exists for increasing effective effort on the monkfish fishery, particularly where a large discrepancy exists between baselines and the more restrictive baseline permit is dropped, there is no evidence that this increase in effective effort may translate into an increase in adverse impacts on EFH from fishing activities.	**Uncert ain**
Change fishing year	Monkfish	The current fishing year runs from May 1 through April 30, and is the same as the fishing year under the current Multispecies FMP.	This measure does not alter the duration or intensity of fishing effort beyond that already experienced as a result of the scallop, groundfish, fluke or other trawl gear fisheries.	**0**
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	**+**
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	**+**

Table 107 Description of Status Quo measures that impact EFH that would be in effect under the EFH No Action Alternative (#1).

6.3.3.3.1 Alternative 2

Net economic change to fishery / Equity of potential costs among communities – Alternative 2 would impose no immediate term economic impact on fishery participants over and above the effort control measures contained in the Amendment. These measures do not include any specified area closures nor do they contain specific measures to reduce effort in the monkfish fishery that would clearly reduce habitat impacts. For the reasons noted above, the longer term economic impact of Alternative 2 is not known but could be negative if a significant link between habitat damage and monkfish resource productivity is established.

Differences in EFH Value/Population effects and ecosystem changes- described in Table 108.

Alternative	Feature	Habitat Benefits
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Scallop and multispecies limited access vessels could fish under monkfish only DAS under the restrictions that apply to Category A or B vessels (gear, area, etc.). Several trawl configuration and minimum mesh size options are presented for vessels electing to fish on a combined (with multispecies or scallop) or monkfish-only DAS.	The trawl gear configuration developed by Monkfish PDT and EFH Plan Development Team may reduce impacts to EFH by reducing bottom contact time. Potentially, an increase in DAS usage by scallop and groundfish vessels could occur. However, this increase is unpredictable at this time.
Minimum mesh size on directed MF DAS	Increase the codend mesh from 10-inch square or 12-inch diamond mesh to 12-inch square mesh.	• Expected to improve bottom habitat conditions iby reducing bycatch and mortality of benthic organisms. • May reduce the incentive for monkfish trawlers to fish in areas where regulated multispecies make up a component of the catch, thus reducing trawling impacts on EFH for those species in areas where directed trawling for monkfish occurs.
NFMA Monkfish trawl experimental fishery		Potential for a positive impact on EFH if the gear tested is shown to reduce adverse effects on EFH.

Table 108- Potential habitat benefits of non-habitat Amendment 2 management alternatives

Because the Councils did not select any measures that provide additional habitat benefits, as identified in Table 108, *there are no longer habitat benefits associated with this alternative. Therefore, it is no longer practicable alternative in terms of habitat protection.*

6.3.3.3.2 Alternative 3

Alternative 3, which intended to use the habitat benefits of measures implemented in Amendment 10 to the Atlantic scallop FMP and Amendment 13 to the Northeast Multispecies FMP, has been absorbed into the No Action Alternative (EFH Alternative 1).

At the time of the preparation of the Amendment 2 DSEIS, the New England Council was considering significant measures to mitigate adverse impacts (via gear modifications, effort reductions and habitat closed areas) of fishing with trawls, scallop dredges and hydraulic clam dredges on EFH in Amendment 10 and Amendment 13. Because the timing of the Councils' deliberation on alternatives to include in the Monkfish Amendment 2 DSEIS occurred simultaneously with the final decisions by the New England Council on these other two major FMP amendments, the decision was made to include Alternative 3 in the DSEIS. This decision was made with the understanding that if Amendment 10 and 13 were implemented prior to the submission of Council decisions on Amendment 2, then the measures outlined in Alternative 3 would become part of the No Action alternative as the implemented measures are considered part of the Status Quo. As such, all status quo measures that may have a habitat impact have been outlined in Alternative 1. See Table 107 for a description of the No Action Alternative for EFH and the estimated habitat impacts.

Because the measures in Alternative 3 have been subsumed into the No Action Alternative, this alternative is no longer practicable.

6.3.3.3.3 Alternative 4

Net economic change to fishery / Equity of potential costs among communities -
Alternative 4 may have some short term negative economic effects depending on which trawl configuration option is selected and in which management area the configuration requirements would apply. Option 2 would only impact trawl vessels that elect to fish on a monkfish-only DAS, and absent an exempted fishery status in the Northern Area, would only affect vessels that fish in the Southern area. Similarly, Option 3 would only affect vessels using trawl gear on a monkfish-only DAS in the SFMA.

Changing the trawl configuration would require vessels using non-conforming gear to bear the cost of making the necessary changes. Vessels may also find it impossible to fish in certain areas depending on which option is selected for the maximum disc diameter.

Differences in EFH Value / Population effects and ecosystem changes -
This net was designed to be efficient at catching monkfish while reducing the incentive and ability to fish in more complex bottom. By developing a net that removes the incentive to fish on hard bottom, then the hard bottom that is EFH for other species will be protected. Therefore, this net is likely to change directed monkfish fishing behavior off complex bottom, and onto more muddy substrates.

Overall, this alternative is practicable.

6.3.3.3.4 Alternative 5AB and Alternative 5C

These alternatives contain measures to protect deep-sea canyon habitats. The economic effect of these closures was estimated by identifying all fishing activity that took place inside each of these proposed areas using position coordinates provided in VTR's for fishing years 1999 and 2001. The following summarizes the findings by closure area for Option 1 (closure to trawl gear on a monkfish DAS) and Option 2 (closed trawl and gillnet gears on a monkfish DAS). Note that since call-in records cannot be directly matched with logbooks any trip where monkfish was at least 50% of total weight of fish on board were assumed to be on a monkfish DAS.

The canyon habitat closed areas will benefit not only the EFH found in these areas, but also the other community components such as deep-sea corals. Alternative 5AB, and to a greater extent Alternative 5C, would also protect deep-sea canyon habitats from potential fishing activity targeting other deepwater species, to the extent that vessels fishing on a monkfish DAS become involved in exploring and developing those alternative fisheries. Installing protective measures before any such fisheries become established reduces the cost of such protections when compared to the cost of closing an established or burgeoning fishery in which vessels have already made capital investments. In Europe, a number of established deepwater fisheries have been displaced or shut down as coral protection closures were implemented in recent years. While such fisheries are not yet taking place in this region, it is likely that they will in the reasonably foreseeable future as the combination of technological advances and restrictions in other fisheries make such alternative fisheries attractive to large trawl vessels. These preventative and precautionary alternatives are practicable because they avoid costs of displacement or elimination of future fishing effort. The absence of any negative economic or social impact on the monkfish fishery (or on any other fishery that currently uses these areas, but will not be affected by the closures) also means that either closed area alternative is practicable despite the fact that EFH is only designated for a few managed species in portions of the closed areas.

Alternative 5A/B (Oceanographer and Lydonia Canyons)

Net economic change to fishery / Equity of potential costs among communities

No trips were identified as having taken place within the Oceanographer/Lydonia Canyon closure areas. Therefore, based on the criteria used for purposes of analysis, the economic effect of Alternative 5AB would be zero.

Differences in EFH value / Population effects and ecosystem changes

The EFH composition of Alternative 5AB is summarized in Section 6.3.1.5. Eight of the 22 species and life stages with benthic EFH that is moderately or highly vulnerable to bottom tending gear in waters deeper than 200 meters are contained in the two areas included in this closure. This alternative does contain almost all of the known coral recorded in Oceanographer and Lydonia canyons.

Overall, this alternative is practicable.

Alternative 5C (Large, Steep-Walled Canyon Closures)

Net economic change to fishery / Equity of potential costs among communities
Up to 12 canyon areas were identified under this closure alternative. Within these areas, there were about 34 directed trips identified from the 1999 and 2001 VTR database. Assessment of all non-directed monkfish trips indicates that the majority were targeting squid or whiting while most other trips were associated with a directed summer flounder fishery. Under closure Option 1 a total of 9 trawl trips would be affected based on 1999 data and less than 3 trips would be affected based on 2001 data. Option 2 would affect an additional 21 gillnet trips based on 2001 data.

Differences in EFH Value / Population effects and ecosystem changes-
The EFH composition of Alternative 5C is summarized in Section 6.3.1.5. Fourteen of the 22 species and life stages with benthic EFH that is moderately or highly vulnerable to bottom tending gear in waters deeper than 200 meters are contained in the 12 closed areas included in this alternative. Canyons other than Oceanographer and Lydonia canyons are not as well represented in the soft coral database (see Section 6.3.1.5), but most of them have not been as thoroughly surveyed as Lydonia and Oceanographer canyons.

This alternative is not practicable for a number of reasons. Fishing effort data show that more social and economic impacts would be incurred by the closure of all 12 steep-walled canyons proposed in Alternative 5C as compared to Alternative 5AB, which proposes to close only Oceanographer and Lydonia canyons. Additionally, coral presence and absence data for the remaining 10 canyons not included in 5AB were not readily available. As such, the best available science supports only the closure of Alternative 5AB at this time. In other words protection of deep-sea corals in all 12 steep-walled canyons proposed in Alternative 5C would be less certain than in Alternative 5AB, until such time as additional surveys were conducted which documented the presence of corals in the other canyons included in this alternative.

6.3.3.4 Summary

Table 109 summarizes the practicability of the measures under consideration and the implementation of measures by the Council to minimize adverse effects of monkfish fishing on EFH in the Northeastern U.S.

Alternative	Practicable?	Implemented by Council?	Notes
Alt 1 *Status Quo/No Action*	Yes	**No**	Selected additional measures to protect habitat instead.
Alternative 2 *Complementary benefits of other Amendment 2 actions to EFH*	No	Yes	Measures with incidental positive benefits to EFH were not implemented.
Alternative 3* *Complementary benefits of other Amendment 13 (GF) and Amendment 10 (SC) actions to EFH*	Not assessed	Yes	Due to timing, this alternative was folded into Alternative 1.
Alternative 4 *Monkfish trawl gear modification*	Yes	Yes	Some measure options were dependent on de-coupling of DAS in FMP which was not implemented.
Alternative 5AB *Inclusion of habitat closed areas in Lydonia and Oceanographer canyons*	Yes	Yes	Lydonia and Oceanographer Canyons closed to fishing on a monkfish DAS – applies to both gillnet and trawl vessels.
Alternative 5C *Inclusion of all 12 steep-walled canyons in northeast as habitat closed areas*	No	No	Not enough scientific information on presence of corals in all 12 canyons at this time.

Table 109 Summary of practicability and implementation of measures to protect vulnerable EFH in Amendment 2

** Alternative 3 was folded into Alternative 1 as the implementation of both Amendment 13 to the Northeast Multispecies FMP and Amendment 10 to the Atlantic Sea Scallop FMP occurred between the publication of the Amendment 2 DSEIS and the Council's final decisions.*

6.3.4 EFH Assessment

6.3.4.1 Description of the Action

For a full description of the proposed action, please refer to Section 4.1.

6.3.4.2 Assessing Potential Adverse Impacts

6.3.4.2.1 Experts Opinion

See Types of Gear Effects in Gear Effects Evaluation and Vulnerability of Benthic EFH to Bottom-Tending Fishing Gears in Appendix II. To summarize, positive and negative effects of otter trawls from 23 of these publications are listed by substrate type in Table 110 through Table 112, along with recovery times (when known). Without more information on recovery times, it is difficult to be certain which of the negative effects listed in these tables last for, say, more than a month or two. In fact, it is difficult to conclude in some cases (e.g., furrows produced by trawl doors) whether the habitat effect is positive, negative, or just neutral. Despite these shortcomings in the information, the scientific literature for the NE region does provide some detailed results that confirm the previous determinations of potential adverse impacts of trawls and dredges that were based on the ICES (2001), NRC (2002), and Morgan and Chuenpagdee (2003) reports.

Physical Effects	**Recovery**
Doors produce furrows/berms	2-18 months
Repeated tows increase bottom roughness	
Re-suspension/dispersal of fine sediments	
Rollers compress sediments	
Smoothing of surface features	
Biological Effects	
Reduced infaunal abundance	Within 3 ½ months (1 of 2 studies)
Reduced number of infaunal species	Within 3 ½ months
Reduced abundance of polychaete/bivalve species	Within 3 ½ months (1 of 2 studies)
Increased food value of sediments	
Increased chlorophyll production of surface sediments	
Removal/damage of epifauna	
Reduced abundance of brittlestars	
Increased number of infaunal species	
Increased abundance of polychaetes	
Decreased abundance of bivalves	
Altered community structure	18 months

Table 110 - Effects and Recovery Times of Bottom Otter Trawls on Mud Substrate in the Northeast Region as Noted By Authors of Eight Gear Effect Studies.

Physical Effects	Recovery
Doors produce furrows/berms	Few days – a year
Smoothing of surface features	Within a year
Re-suspension/dispersal of fine sediments	No lasting effects
Biological Effects	
Mortality of large sedentary and/or immobile epifaunal species	
Reduced density of attached macrobenthos	
Removal/damage of epifauna	
Reduced abundance of polychaetes	
Reduced abundance/biomass of epibenthic organisms	
Reduced biomass/average size of many epibenthic species	
Epifauna (sponges/anemones) less abundant in closed areas	

Table 111 - Effects and Recovery Times of Bottom Otter Trawls on Sand Substrate in the Northeast Region as Noted By Authors of Twelve Gear Effect Studies.

Physical Effects	Recovery
Displaced boulders	
Removal of mud covering boulders and rocks	
Groundgear leave furrows	
Biological Effects	
Reduced abundance of attached organisms (sponges, anemones, soft corals)	
Damaged sponges, soft corals, brittle stars	12 months

Table 112 - Effects and Recovery Times of Bottom Otter Trawls on Gravel and Rock Substrate in the Northeast Region as Noted By Authors of Three Gear Effect Studies.

The following conclusion can therefore be reached: Adverse and potentially adverse habitat impacts from bottom trawling occur throughout most of the NE region on a variety of substrates.

6.3.4.2.2 Determinations

Otter trawls will have a potential adverse effect on the EFH of species and benthic habitat types listed in Table 113. These species and life stages have been determined to be moderately or highly vulnerable to these gear types. In some cases the adverse effects may be significant (high vulnerability) and are denoted as well. For a detailed look at the full gear effects evaluation and adverse impacts determination, refer to Appendix II of the Amendment 2 FSEIS.

Species	Lifestage	Vulnerability to Otter Trawling	Depth in meters (EFH Designation)	Substrate (EFH Designation)
American Plaice	A	High	45-150	sand or gravel
American Plaice	J	Mod	45-175	sand or gravel
Atlantic Cod	A	Mod	25-75	cobble or gravel
Atlantic Cod	J	High	10-150	rocks, pebble, gravel
Atlantic Halibut	A	Mod	20-60	sand, gravel, clay
Atlantic Halibut	J	Mod	100-700	sand, gravel, clay
Barndoor Skate	A	Mod	0-750, mostly <150	mud, gravel, and sand
Barndoor Skate	J	Mod	0-750, mostly <150	mud, gravel, and sand
Black Sea Bass	A	High	20-50	structures, sand and shell
Black Sea Bass	J	High	1-38	rough bottom, shell and eelgrass beds, structures and offshore clam beds in winter
Clearnose Skate	A	Mod	0-500, mostly <111	soft bottom along shelf and rocky or gravelly bottom
Clearnose Skate	J	Mod	0-500, mostly <111	soft bottom along shelf and rocky or gravelly bottom
Haddock	A	High	35-100	pebble gravel
Haddock	J	High	40-150	broken ground, pebbles, smooth hard sand, smooth areas between rocky patches
Little Skate	A	Mod	0-137, mostly 73-91	sand or gravel or mud
Little Skate	J	Mod	0-137, mostly 73-91	sand or gravel or mud
Ocean Pout	A	High	<110	soft sediments
Ocean Pout	J	High	<80	smooth bottom near rocks or algae
Ocean Pout	L	High	<50	close to hard bottom nesting areas
Ocean Pout	E	High	<50	hard bottom, sheltered holes
Pollock	A	Mod	15-365	hard bottom, artificial reefs
Red Hake	A	Mod	10-130	sand and mud
Red Hake	J	High	<100	shell and live scallops
Redfish	A	Mod	50-350	silt, mud, or hard bottom
Redfish	J	High	25-400	silt, mud, or hard bottom
Rosette Skate	A	Mod	33-530, mostly 74-274	soft substrates including sand/mud and mud
Rosette Skate	J	Mod	33-530, mostly 74-274	soft substrates including sand/mud and mud
Scup	J	Mod	0-38	inshore sand, mud, mussel and eelgrass beds
Silver Hake	J	Mod	20-270	all substrate types
Smooth Skate	A	High	31-874, mostly 110-457	soft mud, sand, broken shells, gravel and pebbles

Species	Lifestage	Vulnerability to Otter Trawling	Depth in meters (EFH Designation)	Substrate (EFH Designation)
Smooth Skate	J	Mod	31-874, mostly 110-457	soft mud, sand, broken shells, gravel and pebbles
Thorny Skate	A	Mod	18-2000, mostly 111-366	sand gravel, broken shell, pebble, and soft mud
Thorny Skate	J	Mod	18-2000, mostly 111-366	sand gravel, broken shell, pebble, and soft mud
Tilefish	A	High	76-365	rough, sheltered bottom
Tilefish	J	High	76-365	rough, sheltered bottom
White Hake	J	Mod	5-225	pelagic during pelagic stage and mud or fine sand during demersal stage
Winter Flounder	A	Mod	1-100	estuaries with mud, gravel, or sand
Winter Skate	A	Mod	0-371, mostly <111	sand, gravel, or mud
Winter Skate	J	Mod	0-371, mostly <111	sand, gravel, or mud
Witch Flounder	A	Mod	25-300	fine-grained sediment
Witch Flounder	J	Mod	50-450	fine-grained sediment
Yellowtail Flounder	A	Mod	20-50	sand and mud
Yellowtail Flounder	J	Mod	20-50	sand and mud

Table 113 Species with EFH vulnerable to otter trawl gear.

6.3.4.3 Minimizing or Mitigating Adverse Impacts

In order to minimize and mitigate the adverse effects of the fishery on EFH the Council will implement Habitat Alternative 4 and Alternative 5AB.

In Amendment 13 to the Multispecies FMP and Framework 16 to the Scallop FMP, the New England Council implemented a range of measures to minimize the impacts of bottom trawling in the Gulf of Maine, George's Bank and Southern New England. In addition to the significant reductions in days-at-sea and some gear modifications, the Council closed 2,811 square nautical miles to bottom-tending mobile fishing gear (known as Habitat Closed Areas). Because the monkfish fishery overlaps significantly with the groundfish fishery in the northern fishery management area and the habitat closed areas extend into the southern fishery management area, measures to protect habitat in Amendment 10 and Amendment 13 assist in minimizing the effect of fishing on EFH in the monkfish fishery.

The alternatives selected for implementation in Amendment 2 focus on those areas (offshore/shelf slope/canyons) and gears modifications (trawl mesh) where the monkfish fishery operations do not overlap (spatially or gear use) with the groundfish or scallop fishery. This is depicted in the following Venn-diagram:

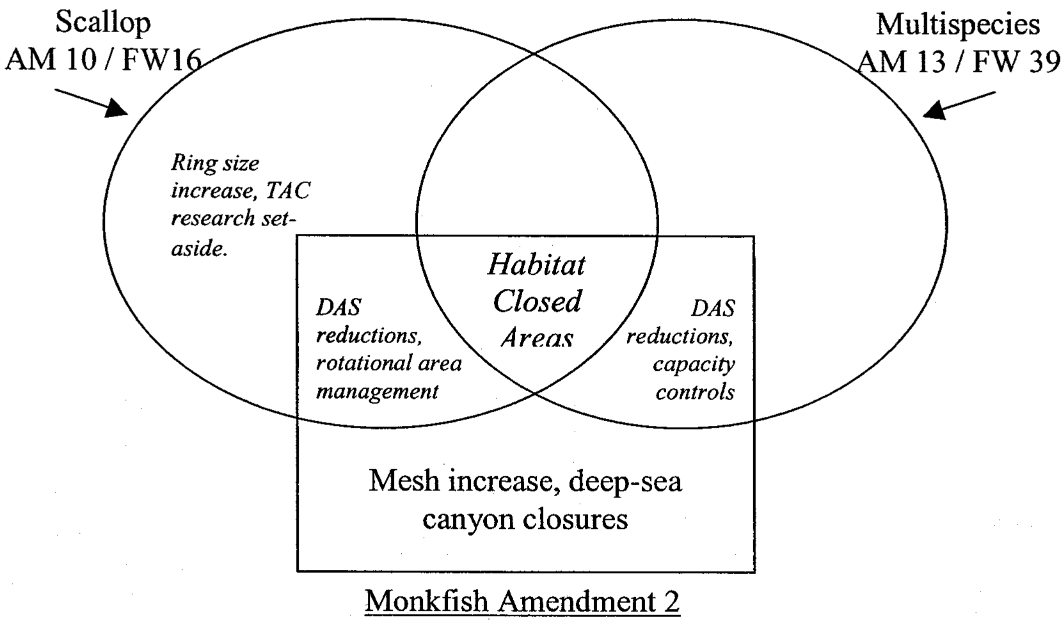


Figure 85 - Venn-diagram depicting intersections of measures in last major NEFMC amendments to minimize the adverse effects of fishing on EFH and additional measures that may have benefits to EFH.

6.3.4.3.1 Habitat Alternative 4

The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

This trawl gear measure was developed during a cooperative workshop involving trawl industry members and gear technology experts. Participants agreed that the primary sediment type in areas where directed monkfish trawling occurs is mud, in both northern and southern areas, although during migration periods monkfish are caught in sandy and more complex bottom types. In the southern area the bottom characteristics are more consistent over large areas, while in the northern area, there is a greater diversity of bottom types, ranging from soft mud to large boulders, and even soft mud areas have cobble and boulders distributed unevenly across the surface. These bottom characteristics greatly influence the types of nets used in each area. In the northern area, vessels use nets that are optimized for fishing in mixed bottom types characteristic of the region. Since vessels can carry only one, or sometimes two rigged nets, they are using nets suitable for groundfish fishing, not necessarily optimized for trawling for monkfish. In the southern area, vessels generally use nets that are optimized for fishing in soft bottom, sand and mud. Under these conditions, southern area vessels can target monkfish successfully with smaller roller gear, and such a restriction would effectively ensure that such vessels do not fish in areas of more complex bottom characteristics, particularly in the offshore canyons.

6.3.4.3.2 Habitat Alternative 5AB

The Councils propose closing Oceanographer and Lydonia Canyons deeper than 200 meters, a total closure of 116 square nautical miles, to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater canyon, hard bottom communities.

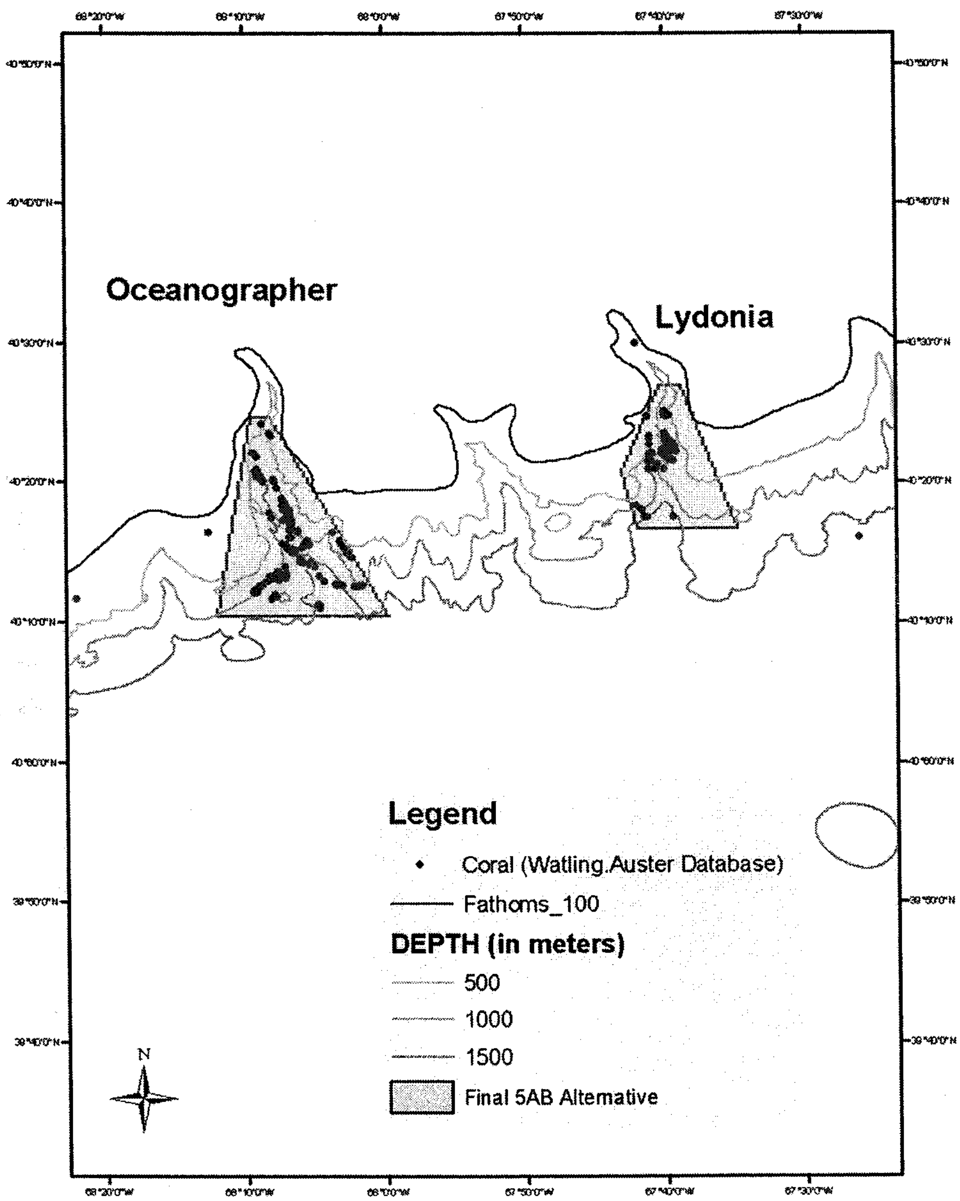


Figure 86 - Habitat Alternative 5 AB (shaded areas in Oceanographer and Lydonia Canyon)

Note that location of known soft coral is mapped as well (Watling and Auster).

6.3.4.3.3 Analysis of Alternatives to Minimize Adverse Effects of Fishing on EFH

For a full analysis of the alternatives selected to minimize or mitigate adverse effects from fishing on EFH in Amendment 2 to the Monkfish FMP, see Section 6.3.

6.3.4.4 Impacts to EFH from non-EFH proposed measures in Amendment 2

Proposal	Habitat Impact	Feature	
Incidental Catch – 50 lbs./day, 150 max.	0 (neutral)	Applies on all vessels not on a DAS and fishing with small mesh, and handgear, includes multispecies limited access vessels that are less than 30 feet (and, therefore, exempt from multispecies DAS) regardless of gear used.	Retention amount is insignificant in comparison to the quantity and value of the target species. Unlikely that those vessels will alter their behavior to target 50 lbs. of monkfish per day since the risks will likely outweigh benefits.
Minimum Fish Size	0 (neutral)	11" tail, 17" whole, both areas	Unlikely that changes to the minimum fish size will have a significant effect on total fishing effort by bottom trawl vessels in the directed monkfish and groundfish fisheries.
Closed Season	0 (neutral)	Eliminate April – June 20-day block out requirement on Category A and B vessels	Small blocks out of fishery will not reduce trawling effects to any measurable degree and eliminating the requirement will not have any effect on habitat.
Offshore SFMA Fishery Program	-/0 (negative)	Enrollment program; Oct. – April; 1,600 lbs. (tail) per DAS; pro – rated DAS allocations; VMS; Category A & B gear requirement; (see text for area and other details)	May affect deep water benthic habitats on the edge of the continental shelf by enabling vessels to return to traditional areas. Potential exists for some interaction if vessels expand the range of their operations beyond historical areas. EFH Alt. 5AB, roller gear restriction and pro-rated DAS on enrolled vessels contribute to mitigate these potential effects.
Modification of Permit Qualification – South of 38°N	0 (neutral)	Vessels qualify for limited access permit with landings south of 38°N, during 3/15 – 6/15, 1994-1998; 50,000 lbs. (tail) for Category A or C permit; 7,500 lbs. for Category B or D; may only fish for monkfish south of 38°20'N	May result in up to 5 new vessels entering the fishery, however, vessels use large-mesh gillnet which have minimal impact on bottom habitats. If some of those vessels converted to trawl gear, impact will be small and likely occur on sandy bottom.
Modify the Framework Adjustment Procedure	0 (neutral)	Framework adjustments can be done to implement transferable MF DAS; measures to minimize impact on protected species; or bycatch reduction devices	Administrative.
NAFO Regulated Area Exemption Program	0 (neutral)	Vessels exempt from permit, mesh size, effort control and possession limit rules while fishing under High Seas Permit in NAFO Area; landings do not count against TAC	None of the proposed measures are expected to affect EFH.
Cooperative Research – DAS set aside	0/+ (neutral)	Vessels responding to cooperative research RFP may be allocated MF DAS; pool of 500 DAS deducted from total DAS allocation	May result in an increased knowledge of fishing impacts on EFH, and the development of measures to minimize the impact of the fishery on EFH. Expected to have neutral direct effects on habitat because does not result in increased effort.
Cooperative Research – DAS exemption	0/+ (neutral)	Vessels applying for MF cooperative research may obtain exemption from DAS usage requirements; available DAS limited to residual of DAS set-aside pool after RFP awards	May result in an increased knowledge of fishing impacts on EFH, and the development of measures to minimize the impact of the fishery on EFH. Expected to have neutral direct effects on habitat because does not result in increased effort.
Clarification of Vessel Baseline	0/+ (neutral)	Vessel length, tonnage and horsepower baseline to be set at those of first federal permit; only on request of vessel owner during first year after implementation	While increases in vessel size and horsepower could affect the vessel's impact on EFH by enabling it to fish in more areas, to fish in deeper water, and on more hard bottom, this proposal will not likely impact EFH because the upgrading provision will only equalize two existing baselines, not increase the overall baseline.

Table 114 - Impacts to EFH from non-EFH proposed measures in Amendment 2

Overall, the impacts to habitat from the non-habitat proposed measures will be slightly negative due to the potential expansion of the offshore fishery into deep-sea canyon communities. However, this impact is mitigated by the closure of Oceanographer and Lydonia canyons deeper than 200 meters to vessels fishing on a monkfish day-at-sea, the six-inch roller gear restriction in the SFMA, and the pro-rating of DAS allocated to vessels enrolled in the offshore fishery program.

6.3.4.5 Conclusion

The management measures, implemented through this action, minimize the adverse effects of fishing on EFH, to the extent practicable pursuant to Section 303(A)(7) of the MSA.

6.3.4.6 Proposed mitigation

None required.

6.4 Economic Impacts

The following section examines the expected economic impacts of the proposed action and of the alternatives considered in the DSEIS but not adopted by the Councils.

6.4.1 Economic Impacts of the proposed action

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.0 that each preferred alternative addresses. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission. The following section contains a discussion and analysis of the economic impacts of the proposed action.

The proposed management changes contain a variety of measures that would have an impact on vessels that participate in monkfish fisheries. These measures include gear changes, minimum fish size, closed seasons, and provisions for a special access program in the SFMA, as well as qualification for fisheries south of 38° N. In addition, the Amendment contains provisions to address bycatch, Essential Fish Habitat, cooperative research, and exemptions for vessels fishing outside the U.S. EEZ. For the most part, the economic impact of these potential changes will include some monetary component, but this monetary impact is very difficult to quantify. For this reason, much of the following contains a qualitative assessment of how vessels will be affected relative to taking no action. Even though a quantitative assessment is not possible, in many cases the type of vessel that one may reasonably expect to be affected can be identified. Thus, wherever possible the number of vessels that may be affected is estimated.

6.4.1.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries (see Section 4.1.1).

6.4.1.1.1 Incidental catch – 50 lbs. (tails) per day/150 lbs. maximum

Under the proposed action, vessels fishing with small mesh or handgear would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, up to a maximum of 150 lbs. This trip limit would also apply on vessels holding a limited access multispecies permit that are 30 feet less in length. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

There are currently only 8 vessels permitted in limited access multispecies small vessel category, and these vessels likely fish single day trips due to their small size. Thus, the economic impact of this measure is not likely to be different than the no action alternative for those vessels. Secondly, because of the very small amount of reported monkfish landings by vessels using handgear, the economic impact of this measure on such vessels should also be no different than the no action alternative.

Changes in incidental catch limits would provide small entities an opportunity to retain larger quantities of monkfish than under the no action alternative. Since the proposed change represents an increase over current trip limits, recent data cannot be used to quantify the potential economic impact of a higher trip limit. However, observed data may provide some insights into the number of trips and vessels that may benefit. Data from fishing year 2001 VTR records were used to identify the number of trips that may be affected. For these identified trips, distributions of trip duration, monkfish discards, and monkfish landings were constructed. These distributions provide an indication of the proportion of trips that may benefit from a higher trip limit. During FY2001, 12,000 trips were taken by monkfish permit holders that were identified as potentially subject to the 50 lb. incidental trip limit. Of these, 2,500 trips by 202 vessels reported landing monkfish. The proposed change would convert the 50 lb. trip limit to a daily 50 lb. limit up to a maximum of 150 lbs. This means that the trip limit change would only affect trips that are more than 24 hours in duration and that landed more than 50 lbs.

Approximately two-thirds of the trips landing monkfish landed less than 50 lbs., leaving 835 trips that may have been constrained by the 50 lb. incidental trip limit in FY2001. These trips either caught and landed no more than 50 lbs. of monkfish or caught more than 50 lbs. and discarded any overages. If these discards were reported, an estimate of the additional benefit of being able to retain more monkfish could be estimated. Unfortunately, over 90% of affected trips report no discards at all. Given the fact that fully one-third of affected trips are at exactly the trip limit it seems unlikely that available data would provide a reliable estimate of the economic benefit of increasing the incidental trip limit. Nevertheless, an upper bound estimate can be calculated by assuming that all trips would retain the maximum allowable limit.

As calculated from the logbooks, a total of 3,385 days absent were associated with the 835 trips that may benefit from the proposed action. Given the maximum limit of 150 lbs., trips that were more than 3 days (72 hours) would not be able to retain any more monkfish. This means that a maximum of 75,900 lbs. of monkfish could be retained under this option. The average monkfish price for 2001 was approximately $2.53 per lb. so the maximum revenue gain would be $192,000. Since 112 vessels had at least one trip that would benefit from Option 1, the average benefit would be $1,700 in gross fishing revenue.

6.4.1.1.2 Incidental catch -General Category scallop dredge and clam dredge

The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels. Under current monkfish regulations, neither vessels fishing under a general category permit using scallop dredge gear nor vessels using clam dredges may retain any monkfish. The proposed action would change current restrictions to be equivalent to that of the incidental trip limit of 50 lbs. per day up to 150 lbs. maximum.

Based on FY2001 VTR data, 1,620 trips taken by 52 different vessels were determined to be consistent with either a clam or a general category scallop trip. None of these trips reported any monkfish discards so these data provide no information regarding potential catch rates on general category scallop or clam trips. Of these trips, over 90% were 24 hours or less and 99% of the trips were less than 48 hours. Given these trip durations, the maximum benefit from a 50 lb. trip limit would be 81,000 lbs. or $204,000. This assumes that the catch on every trip is at least 50 lbs., which is unlikely since median landings on incidental trips were only 25 lbs. At this median level, revenue benefits on clam or general category scallop trips would be approximately $102,000 or an average benefit of just under $2,000 per vessel. The proposed incidental trip limit would provide only modest increases above this level since only 10% (162) of general category scallop or clam dredge trips are more than 24 hours in duration and the vast majority of these are no more than 48 hours. Assuming median landings, this leaves a maximum benefit of only $10,250 over and above the 50 lb. incidental trip limit.

6.4.1.1.3 Incidental catch - summer flounder vessels west of 72°30'W

The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island.

The proposed alternative would restore fishing opportunities for vessels involved in a summer flounder fishery in the affected areas. The economic impact of this change was estimated by using FY2001 VTR data for trips taken by vessels with a fluke permit using between 5.5" and 6" mesh and retaining fluke within statistical areas 612, 613, 615, 616, 622, 623, 627, 628, 633, 634, 636, and 637. Although these statistical areas do not correspond precisely to the regulated mesh area boundaries, they provide a rough approximation. Note also that the VTR reports only a single coordinate to represent an entire trip that may have taken place anywhere within a statistical area, so the statistical area may be a better proxy for trips that may be affected by the regulatory change than strict adherence to location data.

By adjusting these observed monkfish landings by the No Action incidental catch limit of 50 lbs. per trip, an estimate of the potential revenues that would be restored under the proposed alternative is obtained. Specifically, across the 114 vessels in the data set that landed monkfish the average annual restored landings would be 326 lbs. of monkfish. At an average price of $2.53 per lb., this translates into $825 per vessel. However, the impact varies considerably across vessels, ranging from no impact (i.e., no observed trip exceeded 50 lbs.) to almost $10,000.

6.4.1.2 Minimum fish size

The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA, Section 4.1.2).

The proposed action would implement a uniform minimum fish size in both management areas. The NFMA size limit would be unchanged but the SFMA size limit would be reduced to that of the NFMA (11-inch tail or 17- inches whole). This change would not have any economic impact on trips taken in the Northern area but would increase economic opportunities for vessels fishing for monkfish in the SFMA. A reduction in the size limit may also make fishing in the SFMA area more attractive since some vessels may have chosen to fish in the NFMA to take advantage of the smaller size limit. Without detailed information on the size distribution of the commercial catch in both areas, an accurate assessment of how much economic benefit will accrue to individual vessels is not possible. In addition to this economic benefit, there would be a concurrent reduction in the enforcement burden due to this change.

6.4.1.3 Closed season or time out of the fishery

The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as the multispecies fishery (see Section 4.1.3).

Current regulations require vessels (except Category C or D scallopers) to take a 20-day block out of the monkfish fishery during the spring. This requirement corresponds with the spawning season for monkfish. The proposed action would eliminate this requirement, thereby removing any associated regulatory burden. The extent of the regulatory relief provided by the removal of the 20-day block requirement is unknown. The 20-day block out of the fishery only means that vessels cannot call in a monkfish DAS. It does not mean that vessels cannot fish, nor does it mean that limited access permit holders cannot retain monkfish. Since the 20-day block may be taken at any time during the prescribed period, vessels may choose the specific block they expect to be most advantageous. Nevertheless, removing the requirement would provide vessels with greater flexibility in choosing when to fish for monkfish and when to fish for other species.

6.4.1.4 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

The proposed offshore SFMA would permit enrolled vessels to increase in effect the amount of monkfish that could be retained per DAS. Over a fishing season the program would allow vessels to achieve higher profitability, because more monkfish could be retained using fewer overall inputs. Note that enrolled vessels would use up their DAS at a higher rate so no more fishing time would be used, but vessels would be able to use their available time more efficiently.

Participating vessels would be subject to VMS requirements, meaning vessels currently without VMS would have to bear the cost of installation. However, since participation would be voluntary, each individual would be able to weigh the benefits and costs of obtaining VMS before choosing to enroll. Given the proposed distance from shore, participation in the fishery would likely be limited to larger vessels.

6.4.1.5 Modification of permit qualification for south of 38°00'N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

The vessel level economic impact on affected vessels is likely to be positive, due to the increased opportunity to fish for monkfish in the EEZ, but the magnitude of this impact cannot be determined. These vessels already prosecute a monkfish fishery in state waters during the same limited season when they would be able to fish in the EEZ if they qualified for a federal permit. Secondly, it is unclear if the limitations on this fishery resulting from sea turtle closures would offset any immediate benefit these vessels might realize from obtaining a federal monkfish permit.

Preliminary estimates indicate that under the proposed action 5 vessels would qualify for a limited access permit (all in Categories B and D). Depending on these vessels' level of effort (DAS used) and catch rates, the proposed action could therefore have an impact on the trip limits for other vessels fishing in the SFMA, since the TAC would now be distributed over an increased number of vessels.

In the five years prior to implementation of the FMP in 1999, the five vessels that are expected to qualify for a permit under the proposed action, depended on monkfish for about 25 percent of their total revenues (Table 115), averaging $77,652 in monkfish revenues per vessel out of total average vessel revenues of $480,023. (Note, these revenue figures are for the entire period, not annualized. Some of these vessels may have continued to rely on monkfish since FMP implementation by fishing in state waters and participating in experimental fisheries in 2000 and 2001.

	Revenues Jan 1, 1995 - Nov 7, 1999			
	Monkfish	Other spp	Total	Pct Monkfish
Sum	$465,910	$2,414,226	$2,880,136	
Average	$77,652	$402,371	$480,023	25.2%

Table 115 Pre-FMP vessel dependence on monkfish for five qualifying vessels under the proposed action.

An analysis done by the PDT that assumed the same average DAS usage rate and average catch per DAS as the rest of the fleet, concluded that Category A and C vessels' trip limits would need to be reduced 13.6 lbs./DAS per vessel, while B and D trip limits would have to be reduced 10.1 lbs./DAS per vessel. If 5 new permits were issued, the trip limits would be reduced by approximately 100 lbs./DAS (tail wt.) if the trip limits were originally at 1,200 lbs./DAS (roughly the FY2003 limits), and would be reduced by proportionally smaller amounts at lower trip limits. Comments by the public and the Monkfish Committee, however, suggest that these effects are unrealistically high due to the DAS usage and catch rate assumptions. For that reason, it is not possible to estimate with any degree of confidence what the economic impact would be on the rest of the fleet from the addition of 5 new permits. It should also be noted that if more than 5 permits were added, the impact on trip limits would be proportionally higher. Likewise, fewer additional permits would result in a smaller impact on trip limits.

6.4.1.6 Modifications to the framework adjustment procedure

The Councils propose the following additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section 4.1.6).

Including these items in the list of frameworkable measures under the FMP is administrative in nature, and, therefore, will not result in any economic impacts at this time. The economic impacts associated with any DAS transfer, protected species, or bycatch reduction measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.4.1.6.1 Implement transferable MF-only DAS

Under this proposal, the Councils could consider adopting either DAS leasing or DAS sale provisions in a future framework action.

6.4.1.6.2 Implement measures to minimize fishery impact on protected species

The Councils propose to include measures to protect sea turtles and other species protected under the Endangered Species Act and/or Marine Mammal Protection Act, as the need arises, in the FMP list of actions that can be taken under the framework adjustment process. The list of measures would include gear-specific seasonal/area closures or gear modification.

6.4.1.6.3 Implement requirements to use bycatch reduction devices

The Councils propose to add "bycatch reduction devices" to the list of measures that can be implemented under the framework adjustment process in the FMP.

6.4.1.7 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 would be exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions in some situations. They would be permitted to transit the EEZ with monkfish onboard the vessel or land in U.S. ports monkfish caught while fishing in the NAFO Regulatory Area, provided the vessel complied with certain administrative and gear stowage requirements (see Section 4.1.7).

The proposed action would exempt anyone fishing in the NAFO regulatory area from EEZ regulations. Vessels would be presumed to be compliant with appropriate NAFO regulations and would be issued a High Seas Fishing Compliance permit. This alternative would relieve participating vessels from dual compliance with both EEZ and NAFO regulations and would provide vessels with greater flexibility compared to current regulations. The economic impact of such a change cannot be estimated with precision since it is not known to what extent current regulations inhibit domestic vessels from participating in the NAFO Regulatory Area. Nevertheless, the economic impact is at least likely to be positive since vessels fishing in international waters would be relieved of the more restrictive EEZ measures.

6.4.1.8 Measures to minimize fishery impact on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8).

6.4.1.8.1 Southern Area trawl disc restriction

The Councils propose restricting the diameter of trawl roller gear to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

This action may have some short-term negative economic effects on some of the vessels using trawl gear on a monkfish-only DAS in the SFMA. Vessels using non-conforming gear will be required to bear the cost of making the necessary change. However, this roller gear diameter is already used by most vessels in the SFMA, mitigating the potential impact. In addition, this requirement would effectively limit vessels to the locations they have already fished, and could therefore prevent exploratory fishing to find new productive areas.

6.4.1.8.2 Closure of Oceanographer and Lydonia Canyons to monkfish vessels

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals.

The economic effect of the proposed closure was estimated by identifying all fishing activity taking place within the area using position coordinates provided in VTRs for calendar years 1999 and 2001. Since call-in records cannot be directly matched with logbooks, any trip where monkfish comprised at least 50% of the total weight of fish on board was assumed to be on a monkfish DAS. No trips were identified as having taken place within the Oceanographer and Lydonia Canyon Closure area. Therefore, based on the criteria used for the purpose of analysis, the economic effect of the proposed action would be zero.

6.4.1.9 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research. Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined below (see Section 4.1.9).

Cooperative research has proven to be an important component of monitoring and assessment of the monkfish resource. By creating a DAS set-aside and DAS exemption program, the potential monkfish mortality effects of cooperative research can be accounted for upfront, streamlining the process for initiating and approving cooperative research.

6.4.1.9.1 Research DAS set-aside

A pool of 500 DAS would be set aside from the total monkfish DAS allocated to limited access vessels, excluding any carryover DAS. DAS allocations to limited access vessels would be reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. NMFS will distribute DAS from the pool to vessels responding to an annual cooperative research Request for Proposals (RFP).

This program would spread the set-aside equally across all monkfish vessels but would affect vessels unequally. Vessels that use their full allocation would lose monkfish fishing opportunities. However, if these vessels were also the ones engaged in a cooperative research program, lost DAS would be recouped and total fishing time on monkfish could actually increase. Vessels that do not use their full allocation of DAS would be unaffected by this change.

6.4.1.9.2 DAS Exemption

Under this proposal, DAS set aside under the previous program, and not distributed to vessels in response to the RFP would be used to issue DAS exemptions to vessels to conduct monkfish research or surveys. The total DAS available under this program would be the remainder of the DAS pool not distributed under the annual RFP process.

This program would exempt DAS used in a cooperative research project from counting against a vessel's allocation. Since the DAS exemption program draws from the 500 DAS set-aside, vessels would not see a further reduction in their DAS allocations, but those vessels using their full allocation and not participating in either program would lose monkfish fishing opportunities. However, like the set-aside, an exemption program would make it possible for some vessels to realize an increase in monkfish fishing opportunity through participation in cooperative research projects.

6.4.1.10 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

Clarification of vessel baseline would have no immediate economic impact on a vessel's ability to earn fishing income in the monkfish fishery as no proposed measures are specifically tied to any physical dimension of the vessel. A change in baseline could affect the value of a vessel depending on whether the baseline is higher or lower than the current monkfish baseline. A change in baseline may also have some implications in the event a DAS leasing program is developed. The DAS leasing program for Amendment 13 of the Multispecies plan is based on a vessel's baseline. This leasing program makes it possible for smaller vessels to obtain DAS from larger vessels but leases from smaller to larger vessels would not be allowed. Within this setting, the smaller the baseline, the larger the pool of potential trading partners. However, since the adjustment under the proposed action can only be made at the request of the vessel owner, presumably only those who would benefit would make such a request.

6.4.1.11 Economic impact of no action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13).

6.4.1.11.1 Impact of DAS usage no action alternative

This alternative would continue the existing effort control program in the monkfish fishery. Category C and D permits also hold either a multispecies or scallop limited access permit, and when on a monkfish DAS must also use a multispecies or scallop DAS. Each vessel must weigh the opportunity cost of using a monkfish DAS to target monkfish against the value of using a scallop or multispecies DAS to target one of those fisheries. According to the data in Table 38, Category C and D vessels used less than 50 percent of the allocated monkfish DAS, and no scallop/monkfish DAS were used. The economic impact of the no action alternative are unchanged from that of the original FMP, except that the proposed offshore fishery program may provide some economic relief for vessels that were negatively impacted by the FMP.

6.4.1.11.2 Impact of trawl minimum mesh size no action alternative

The current minimum trawl mesh size for vessels fishing on a monkfish-only or monkfish/scallop DAS is 10-inch square or 12-inch diamond codend mesh. Compared to the non-preferred alternatives, the cost to vessels would be minimized, since no new nets would have to be purchased. The smaller mesh size of the no action alternative also reduces the escapement of legal sized fish, therefore reduces the inefficiency that results from larger mesh requirements.

6.4.1.11.3 Impact of the experimental fishery no action alternative

Under current regulations, vessels may conduct monkfish research under an Experimental Fishery Permit, as long as the vessels comply with the research and exempted fishing provisions of the Magnuson-Stevens Act. The no action alternative would not modify this ability, and, therefore, does not have an economic impact.

6.4.1.11.4 Impact of fishing year no action alternative

The alternatives under consideration to change the fishing year, including the no action alternative, are administrative and do not result in any economic impact, except that by maintaining alignment with the multispecies fishing year, the permit application burden on vessels and the government is minimized.

6.4.2 Economic Impact of non-preferred alternatives

This section describes the impacts of alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. Since the impact of proposed measures is discussed in comparison to taking no action in the previous section, only those alternatives that contained measures other than the no action alternative are discussed in this section.

6.4.2.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered an alternative for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the alternative, Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. All monkfish limited access permit holders would initially be allocated 40 monkfish DAS but DAS could be reduced to meet rebuilding objectives.

The Councils considered two approaches (Decision 1a, Appendix I): separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b). The Councils also considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform ("fleet") allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery (Decision 1b in Appendix I). If the Councils had decided to adopt the de-coupled DAS program, they were also considering implementing transferable DAS either as a part of the Amendment 2 rule, or deferred to a future action under the framework adjustment process (Decision 1c, Appendix I). They were considering DAS transfer programs modeled after those in Multispecies Amendment 13, by lease or sale (Decision 1d, Appendix I).

Since this measure would have only affected vessels having either groundfish or scallop DAS allocations, separation of DAS would have had no direct impact on the 55 Category A & B limited access or the 2,138 Category E open access vessels that held a monkfish permit in the 2002 fishing year, given that Fleet DAS would have remained at current levels. Since proposed individual DAS allocations are based on past performance, the impact would have been minimal even though some vessels would have seen an increase and others a decrease in allocation. Under individual DAS, the overall level of effort (cumulative of all vessels) would not have been reduced.

The economic impact of separating DAS on the 328 Category C and 334 Category D permit holders would have depended on whether the individuals held a groundfish or a scallop permit and whether they fished, or plan to fished, exclusively in one management area or both. Thus, for purpose of discussion the 662 C&D permit holders are sub-divided into four different groups; vessels that have a scallop permit; vessels that have a groundfish permit that fish exclusively in the NFMA; vessels with a groundfish permit that fish exclusively in the SFMA; and vessels that have a groundfish permit that fish in both management areas. Note that multispecies combination permit holders (Category E) will be treated as a special case of a scallop vessel.

There were 176 scallop permit holders among the 662 C&D vessels, of which, 155 were Category C vessels. A total of 40 scallop permit holders also held a combination (Category E) multispecies permit. Under No Action a scallop vessel may choose to use a monkfish DAS but must forego the opportunity to use a scallop DAS to do so, since scallop vessels cannot direct on monkfish and scallops with a dredge or scallop net. With separation of DAS, scallop vessels could have chosen to fish a monkfish-only DAS without having to give up a scallop DAS. Given current allocations, full- time permit holders would have been able to use scallop gear for 120 DAS and then target monkfish using either large mesh trawl or gillnet gear for an additional 40 DAS. Given current resource conditions in the scallop fishery there is little economic incentive to use a monkfish-only DAS because the opportunity cost of losing a scallop DAS is too high. With separation of DAS, scallop vessels would have been able to diversify their business into a directed monkfish fishery without compromising scallop sales. Note that this does not necessarily mean that all scallop vessels would have taken advantage of the opportunity since it would have required installation of a net reel as well as the purchase of nets. In addition, vessels with little experience in a directed trawl or gillnet monkfish fishery may have been less inclined to take advantage of the separation of DAS. Note, however, scallop vessels that did decide to add directed monkfish activity to their overall business would have been competing with other limited access permit holders for a limited resource that could have resulted in a change in the distribution of monkfish revenues among vessels. If scallop vessels chose to fish with gillnets it may also have contributed to increased gear conflicts with other vessels as competition over limited bottom would have increased.

Even though separation of DAS would have offered scallop vessel owners an opportunity to expand their business, this opportunity would have been enhanced under Alternative 1B compared to Alternative 1A. Neither alternative would have had any affect on scallop activity but Alternative 1B would have made it possible for a scallop vessel to use monkfish-only DAS in either the NFMA or the SFMA, whereas, Alternative 1A would have meant that, if enrolled, the vessel could have only used a monkfish-only DAS in the SFMA.

While the general impact on scallop vessels is unambiguous, the impact of separation of DAS for limited access multispecies vessels is less clear largely because the regulations under which a vessel may participate in the monkfish fishery depend on the area fished, and absent an exempted trawl fishery in the NFMA, gear used. For this reason, multispecies vessels have been subdivided into three categories based on area fished.

Alternative 1A would have required an annual declaration to decouple DAS in the SFMA only. Such a declaration would have meant that the vessel could still declare on a trip-by-trip basis whether a monkfish-only or a combined DAS was being used, but could only fish for monkfish in the SFMA. Vessels that did not declare for decoupled DAS would have fished for monkfish and multispecies under No Action regulations.

For vessels that fish for monkfish exclusively in the NFMA the economic effect of Alternative 1A would have been unchanged relative to the no action alternative since the trip-by-trip choices available to these vessels would have been unaltered. That is, assuming a 40 DAS monkfish allocation, a vessel with 50 groundfish DAS would still have been limited to fishing a maximum of 50 DAS for either monkfish or groundfish and would still have been able to fish up to 10 groundfish-only DAS without a monkfish trip limit. By contrast, if a vessel did declare into the SFMA it would have been possible to fish up to 50 groundfish-only and 40 monkfish-only DAS but would not have been able to use a monkfish-only or a combined DAS in the NFMA. Thus, while vessels that fish for monkfish only in the NFMA may have elected to have separation of monkfish DAS, doing so would have required a complete change in fishing location that could have required a change in homeport as well. Such a decision seems unlikely to make economic sense particularly when the majority of vessels that fish for monkfish only in the NFMA also fish for all other species exclusively in the NFMA.

Alternative 1B would have required an annual declaration to decouple DAS but would not have required an area designation. Vessels that elected to have separated DAS would still declare on a trip-by-trip basis whether they were fishing a groundfish-only, a monkfish-only or a combined DAS, but would have had to fish as Category E vessel in both management areas on a groundfish-only DAS. For vessels that fish exclusively in the NFMA this condition would have meant that the vessel would not be able to fish without a monkfish trip limit on a groundfish-only DAS. Vessels would have retained the option to fish without separated DAS, under No Action rules. Compared to the no action alternative, Alternative 1B would have provided greater flexibility to vessel owners and would have allowed them to choose whichever option would be most likely to improve economic performance.

At least until an exempted fishery has been established for a monkfish trawl fishery in the NFMA, trawl vessels that fish only in the Northern area may not be likely to declare for separated DAS since there would be nowhere to fish on a monkfish-only DAS in the North. This would have meant that potential gross revenue could have actually declined relative to No Action because the vessel would have been limited to fishing 40 combined DAS and 10 groundfish-only DAS with a 400 lb. per DAS trip limit. If the same vessel elected to fish under No Action it would be able to fish up to 50 groundfish DAS with no monkfish trip limit.

Depending on fishing patterns, gillnet vessels may have been better off with separation of DAS since an exempted fishery already exists in the NFMA. This means that gillnet vessels would have had an opportunity to increase total fishing days for monkfish and groundfish, although they may still not have elected to separate DAS if they still wanted to preserve the option to fish a groundfish-only DAS without a monkfish trip limit.

For vessels that fish exclusively in the SFMA Alternative 1A would have provided an opportunity to increase the total number of DAS that could be used in groundfish and monkfish fisheries combined. Unlike their northern counterparts, declaration into separated monkfish DAS would have been advantageous since they already fish monkfish only in the SFMA. Additionally, SFMA vessels would not have been giving up anything if they chose to fish a groundfish-only DAS since the monkfish trip limits would have been the same as No Action. The actual mix of groundfish-only, monkfish-only, or combined DAS that a vessel may have chosen cannot be predicted but Alternative 1A would have given vessel owners greater flexibility than they have now, enhancing their ability to operate a profitable business. Note that vessels that did not elect to have separated DAS would fish under No Action regulations, which would have left vessel owners no worse off than their current position.

Alternative 1B would have had the same economic impact on vessels that fish for monkfish exclusively in the SFMA. Vessels would still have been able to elect whether to have separated DAS, and would still have been able to declare into a monkfish-only, groundfish-only, or combined DAS on a trip-by-trip basis. Alternative 1B would have provided vessels with greater flexibility, however, because vessels would have been able to fish a monkfish or a combined DAS in the NFMA. Having this choice does not necessarily mean that vessels that fish only in the SFMA would actually have chosen to shift some effort to the Northern area since most of these vessels fish for all species only in the Southern area and many are based out of ports in Southern New England or the Mid-Atlantic states. Nevertheless, Alternative 1B would have provided vessels with greater flexibility and an opportunity to improve profitability compared to either No Action or Alternative 1A.

For vessels fishing in both management areas and not electing to have separated DAS, Alternative 1A would have had no economic impact relative to Alternative 2 since these vessels would have fished under No Action rules. Presumably, vessel owners that did declare into a separated DAS for the SFMA would have done so because they believed they could be more profitable. These vessel owners would have been able to continue to fish for monkfish in the SFMA but would have had to give up any directed monkfish trips that may have been taken in the NFMA and they would no longer have been able to take a groundfish-only trip in the NFMA and fish without a monkfish trip limit.

Alternative 1B would generally have had the same impact as Alternative 1A on these vessels, but would have provided vessel owners with more flexibility. Specifically, vessels owners would have been able to fish for monkfish on either a monkfish-only or a combined DAS instead of being limited to the SFMA-only for directed monkfish fishing.

Overall, separation of DAS would not have made any vessel worse off than they would be under No Action since all vessels would have had the choice to separate DAS or to fish under current regulations. In either case, vessels would have retained the ability to fish a groundfish or scallop-only DAS, a monkfish-only DAS, or a combined DAS. Therefore, the economic impact of either Alternative 1A or Alternative 1B was likely to have been positive, or at worst neutral, relative to No Action (Alternative 2).

It should be noted, however, that this analysis is based upon the assumption that overall effort level within the monkfish fishery would not have increased due to the DAS separation. If vessels that were previously not active in the monkfish fishery became so due to separated DAS, the trip limits and DAS allocated to currently active vessels would have had to be reduced proportionally to maintain the same overall level of effort that can be allowed for a given TAC. In this case, the economic opportunities of current participants in the fishery could have been reduced.

6.4.2.2 Alternatives to the 50 lbs./trip incidental catch limit

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit, including the no action alternative, and adopted Alternative 2, 50 lbs./day up to 150 lbs. maximum possession. Under non-preferred Alternative 3, vessels would be allowed to retain 50 lbs./day up to 500 lbs. maximum possession up to 50 lbs.

The No Action Alternative would have maintained the current incidental catch limit of 50 lbs./trip, regardless of trip length. While all vessels would continue to face their present economic opportunities, the 112 vessels in FY2001 with at least one trip potentially constrained by the current trip limit would have been required to continue discarding any overages, thus forgoing any economic benefit afforded by the proposed action.

The non-preferred alternative did not affect the total number of potential vessels that may benefit from a trip limit change, but did increase the maximum amount of monkfish that could be retained by extending the maximum trip duration to 10 days (240 hours) over which benefits may accrue. This means that the maximum benefit for the 112 affected vessels would increase to 127,000 lbs. or $322,000, an average benefit of $2,900 per vessel.

6.4.2.3 Minimum trawl mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Under the action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). That would be 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net under Alternative 2, and 12-inch square mesh in the codend under Alternative 3. If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section.

For mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

If any of the mesh alternatives had been adopted, at a minimum individual vessels would have been required to replace any nonconforming gear to the appropriate configuration. Since any of these alternatives would have applied only to trawl gear, the economic impact would be felt only by vessels using large mesh otter trawls. Unless, or until, a large mesh trawl exempted fishery is developed and approved in the NFMA, vessels that fish only in the NFMA would not be affected by the proposed mesh alternatives. However, vessels that fish in the SFMA with large mesh trawl gear may have been affected. Based on FY2001 VTR data the number of vessels using large mesh trawl was very low (12), and only 1 of these used large mesh of 10-inches or greater but less than 12-inches exclusively. VTR data do not provide sufficient information to evaluate net configurations (whether the mesh is diamond or square or what size mesh is in parts of the net), so there is no way to know whether other vessels using 12- inch or larger mesh are using square or diamond mesh.

6.4.2.4 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform 10-inch minimum tail size (Alternative 2, Option 2), and eliminating the minimum size (Alternative 3). Alternative 4, contingent upon the adoption of a monkfish-only DAS program, would have applied a different minimum size when a vessel was on a monkfish-only DAS. None of the alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch.

The No Action Alternative 1 would have maintained the current size limits of 11-inches (tail) or 17-inches (whole) in the NFMA, and 14-inches (tail) or 21-inches (whole) in the SFMA. While all vessels would continue to have the economic opportunities presently available to them, vessels fishing in the SFMA would have continued to face reduced economic opportunities relative to those fishing in the NFMA, since they would have been required to discard fish that would have been of legal size in the NFMA.

Option 2 of Alternative 2 would have implemented a uniform size limit in both management areas but would have reduced the minimum size to 10-inches (tail) or 15-inches (whole). This change would have increased economic opportunities for all vessels fishing for monkfish but would have probably had greater beneficial impact on vessels fishing in the SFMA.

Alternative 3 would have eliminated the minimum size limit and would have provided the greatest economic opportunity for vessels participating in the monkfish fishery. Alternative 3 would not necessarily have meant that all monkfish caught would be retained since there may be a limited market for monkfish below certain sizes. Nevertheless, elimination of the size limit would have provided some incentive to develop markets for smaller monkfish.

Alternative 4 would have adopted a minimum size limit that would be 14- inches (tail) or 21- inches (whole) while vessels are fishing on a monkfish-only DAS. Vessels that typically fish in the SFMA would not have been affected by Alternative 4 since the size limit would be the same as the current regulation allows. Vessels fishing in the NFMA on a monkfish-only DAS might have experienced losses in economic opportunity, but this loss might have been negligible since the size limit would have applied on trips that would have been required to use large mesh anyway.

6.4.2.5 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (2 20-day blocks).

Alternative 3 would have doubled the current 20-day block to 40 days where vessels may choose to take the entire 40-days consecutively or may take two 20-day blocks. This change would have meant that out of a 90-day period vessels would have needed to identify 40 days in 20-day increments to take time out of a directed monkfish fishery. This would have placed a greater burden on trip scheduling and planning since the period (March to May for Category C and D groundfish and April to June for Category A and B vessels) corresponds to a time of year where weather can be quite variable. This could have left vessels with few opportunities to actually fish if weather conditions were poor during the time a vessel had declared into the fishery. As noted in the economic impacts of the proposed action, the economic impact of blocks out of the fishery are difficult to assess since vessels may still engage in other fisheries and may retain monkfish up to bycatch limits for the specified fishery. In a relative sense, however, Alternative 3 would have been more burdensome than Alternative 1 (No Action).

The No Action Alternative 1 would have preserved the current 20-day block out of the fishery requirement for limited access permit vessels. This requirement places a greater burden on trip scheduling and planning since the period (March to May for Category C and D groundfish and April to June for Category A and B vessels) corresponds to a time of year where weather can be quite variable. This can leave vessels with few opportunities to actually fish if weather conditions are poor during the time a vessel had declared into the fishery. As was noted in the economic impacts of the proposed action, the economic impact of blocks out of the fishery are difficult to assess since vessels may still engage in other fisheries and may retain monkfish up to bycatch limits for the specified fishery. While this would have been a continuation of the status quo in the fishery, there is some positive burden associated with the requirement that would be alleviated by the proposed action.

Alternative 3 would have doubled the current 20-day block to 40 days where vessels may choose to take the entire 40-days consecutively or may take two 20-day blocks. This change would have meant that out of a 90-day period vessels would have needed to identify 40 days in 20-day increments to take time out of a directed monkfish fishery. This would have placed an even greater burden on trip scheduling and planning due to the variability of weather during the period, and could have left vessels with even fewer opportunities to actually fish than the No Action Alternative. As was previously noted, the economic impacts of blocks out of the fishery are difficult to assess, but Alternative 3 would have been more burdensome than Alternative 1 (No Action).

If monkfish DAS had been separated, scallop vessels would have also been required to take time out of the monkfish fishery. This would represent a change from the flexibility currently available to scallop vessels, but may not have had a substantial impact. Since implementation of the Monkfish FMP, scallop vessel landings of monkfish have fallen primarily because of improvements in the scallop resource itself. The scallop fishing year begins in March, which corresponds with the beginning of the proposed spawning closure period where a 20-day block (or two 20-day blocks) out of the directed monkish would have been required. Most scallop vessels would more likely be engaged in a directed scallop fishery than a monkfish fishery even if monkfish DAS were separated from scallop DAS. Further, prior to FMP implementation monkfish landings by scallop vessels peaked during the fall and early winter months when monkfish prices (livers in particular) were peaking, and were lowest during spring. This suggests that if scallop vessels were to take advantage of separated monkfish DAS to take a monkfish-only trip, they would most likely use those days during a season other than spring. Therefore, the requirement to take time out of a directed monkfish fishery for 20 or 40 days during March to May would not likely have had a substantial adverse impact on scallop vessels.

6.4.2.6 Offshore SFMA Fishery

The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but non-preferred options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

The No Action Alternative would have continued to subject vessels fishing offshore to the same DAS, trip limits, and gear requirements applying to the same permit category inshore. As a result, the offshore fishery would continue to be unprofitable for most vessels due to the trip limits and, for some vessels, the requirement to use a multispecies or scallop DAS.

As was the case with the proposed action, the non-preferred alternative would have been subject to VMS requirements, so vessels without VMS currently installed would have to bear the cost of installation. However, since this would be a voluntary program, each vessel owner would have been able to weigh the benefits and costs of obtaining VMS. As the non-preferred area option is not significantly different from the proposed area, and given the proposed distance from shore, it is likely that participation in the fishery would be limited to larger vessels.

6.4.2.7 Modification of permit qualification for south of 38°N

The Councils took to public hearings four alternatives that would revise the limited entry qualification period for certain vessels that did not qualify for a permit under the original FMP, plus the no action alternative. The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°N.

	Qualification period – four years prior to:	
Alternative 1	June 15, 1998	(full year)
Alternative 2	June 15, 1997	(full year)
Alternative 3	June 15, 1998	(March 15 – June 15)
Alternative 4	June 15, 1997	(March 15 – June 15)
Alternative 5 (no action)	February 27, 1995	

Table 116 Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

Analysis of the NMFS weighout and NCDMF data indicate that the number of vessels/owners that would qualify for monkfish limited access permits range from three under Options 2 and 4 to seven under Option 1. No vessels in the NMFS weighout database would qualify for a permit under options that only include landings south of 38° N (Options 1-4). NMFS NERO appeals records and permit file data indicate that the 2 vessels that applied for an appeal would qualify for permits under all four options considered.

The vessel level economic impact on affected vessels is likely to be positive, due to the increased opportunity to fish for monkfish in the EEZ, but the magnitude of this impact cannot be determined. These vessels already prosecute a monkfish fishery in state waters and during the same limited season when they would be able to fish in the EEZ if they qualified for a federal permit. Secondly, it is unclear how the limitations on this fishery resulting from the sea turtle closures would offset any immediate benefit these vessel might realize by obtaining a federal monkfish permit.

Depending on the number of vessels actually qualifying for a limited access permit under this program, their DAS used, and catch rates, the four alternatives allowing for new permits could have an impact on the trip limits for other vessels fishing in the SFMA, since the TAC would now be distributed over an increased number of vessels (3-7 vessels). An analysis done by the PDT that assumed the same average DAS usage rate and average catch per DAS as the rest of the fleet, concluded that Category A and C vessels' trip limits would need to be reduced 13.6 lbs./DAS per vessel, while B and D trip limits would have to be reduced 10.1 lbs./DAS per vessel. If 5 new permits were issued, the trip limits would be reduced by approximately 100 lbs./DAS (tail wt.) if the trip limits were originally at 1,200 lbs./DAS (roughly the FY2003 limits), and would be reduced by proportionally less amounts at lower trip limits. Comments by the public and the

Monkfish Committee, however, suggest that these effects are unrealistically high due to the DAS usage and catch rate assumptions. For that reason, it is not possible to estimate with any degree of confidence what the economic impact would be on the rest of the fleet from the addition of 3-7 new permits.

Under the No Action Alternative, no additional permits would have been issued. Consequently, there would not be a potential change to the trip limits for vessels fishing in the SFMA due to this action. Therefore, there should be no economic impacts on those vessels currently participating in the fishery. However, those vessels that would have been denied permits under the No Action Alternative would have had reduced economic opportunities.

6.4.2.8 EFH Alternative 4 Options 1 and 2 (Monkfish trawl configuration)

The Councils considered 3 alternative trawl configurations, including no action, specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated. Under Option 2, the Councils considered six individual elements, described in Section 4.2.2.9.3, that could be taken together or separately, and sought public comment on the specific components. However, this option would only be considered if DAS were de-coupled. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and to reduce the likelihood that they will be used in hard bottom areas that provide EFH for other groundfish species. The Councils adopted Option 3, to establish a maximum disc diameter of 6-inches in the SFMA.

Option 1 of Alternative 4 was the No Action alternative, under which trawl vessels would not have been subject to any specific gear restrictions other than the minimum mesh size and gear/area-based restrictions that may apply because of other FMP regulations. Since this would not have necessitated any gear changes for vessels currently participating in the fishery, there would have been no economic effects.

Some short-term negative economic effects may have arisen from Option 2 of this alternative, depending on the specific trawl configuration selected and the management area to which the configuration requirements would have applied. Option 2 would have affected only trawl vessels electing to fish on a monkfish-only DAS and, absent an exempted fishery status in the Northern Area, would only have affected vessels fishing in the Southern area. Changing the trawl configuration would require vessels using non-conforming gear to bear the cost of making the necessary changes.

6.4.2.9 EFH Alternative 5C (up to 12 large, steep-walled canyons closures)

The Councils considered two closure options to minimize the impacts of the directed monkfish fishery on deepwater corals and adopted Alternative 5AB. Non-preferred Alternative 5C proposed to close waters above up to 12 large canyons from Norfolk Canyon to the Hague Line.

Within these areas, 30 trips that would be affected by this alternative were identified from the 1999 and 2001 VTR database. Assessment of all non-directed monkfish trips indicates that the majority were targeting squid or whiting while most other trips were associated with a directed summer flounder fishery. Under closure option 1, 9 trawl trips would have been affected based on 1999 data and less than 3 trips would have been affected based on 2001 data. Option 2 would have affected an additional 21 gillnet trips based on 2001 data.

6.4.2.10 NFMA Monkfish trawl experimental fishery

The Councils considered a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS.

Participating vessels would have been able to retain both their groundfish and monkfish catch while engaged in the experiment. Should the experiment have proven successful, an exempted trawl fishery could have been established allowing a larger number of vessels increased fishing opportunities under DAS separation. Without separated DAS, there would be little economic benefit for trawl vessels to use larger mesh since they would be better off by using groundfish gear and fishing with no trip limit in the NFMA.

6.4.2.11 Change fishing year

The NEFMC considered changing the multispecies fishing year in Amendment 13 to the Multispecies FMP. The Councils (NEFMC and MAFMC) proposed changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13, and considered three alternatives. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively.

Alternative 2 would have changed the fishing year to correspond to a calendar year. Current reliance on the fall survey index makes the change to a calendar year less of an issue since adequate time is available to make the survey data available, and still have adequate time to make annual adjustments. Alternative 2 would also have aligned the monkfish fishing year with the calendar year fishing years of several other Mid-Atlantic fisheries, potentially assisting vessel owners with annual planning of fishing activities. However, Alternative 2 would have meant that the fishing year would not be aligned with either multispecies or scallop fishing years, which would make the permit renewal process cumbersome, especially since the permit renewal cycle for most fisheries (with the exception of scallops and red crab) is based on the multispecies fishing year. Additionally, whether or not DAS had been separated, the allocation, monitoring, and enforcement of DAS allocations that become renewed at different times of the year would have been complicated. Note that this complication would also extend to vessel owners, as they would also have had to make annual planning decisions based on receiving different DAS allocations at different times of the year.

Alternative 3 would have changed the monkfish fishing year to October - September. This alternative would put monkfish at odds with the permit renewal schedule for every other FMP in the Northeast region and would have increased the cost of applying for and administering these renewals. This alternative would also have introduced some of the same complications noted above both from an administrative and a fishing vessel perspective.

Alternative 4 would have changed the monkfish fishing year to July – June. This alternative offers no clear advantage over Alternative 1, especially since the multispecies fishing year did not change under the Amendment 13 preferred alternative. Given this fact, this alternative would have introduced the same administrative complications and would have complicated vessel business planning.

6.4.2.12 DAS prorating alternatives if the fishing year is changed

Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The Councils considered two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment. Since the Councils took no action to change the fishing year, these administrative alternatives are irrelevant.

6.5 Social and Community Impacts

6.5.1 Introduction

This Social Impact Assessment (SIA) characterizes the magnitude and extent of the social impacts likely to result from the proposed management action as well as from other alternatives considered by the Council during the development of Amendment 2 to the Monkfish Fishery Management Plan (FMP). This SIA will identify and describe all groups of participants and the communities involved in the monkfish fishery both in this section and by reference to the Affected Human Environment section of this document. It will build on information from social impact assessments within previous monkfish actions. A social impact assessment identifies the probable positive and negative impacts from a particular action on the "quality of life" of a community. In addition to the biological and economic impact analysis, this information is provided to help fishery managers make better decisions by clarifying the social and cultural effects of the proposed action.

The mandate to consider the social impacts from proposed federal actions comes from two major laws: the National Environmental Policy Act (NEPA) and the Sustainable Fisheries Act (SFA). NEPA regulations require federal agencies to assess the proposed action's effects on the quality of the human environment, which includes the direct, indirect, and cumulative impacts on the economic and social aspects of the community (40 CFR 1508.14). In addition, SFA contains a National Standard that requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continued access to the fishery, within the constraints of the conservation objectives and condition of the resource.

National Standard 8 of the SFA states that:

> Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities *(16 USC § 1851(2)(8)).*

"Sustained participation" is interpreted as continued access to the fishery within the constraints of the condition of the resource. The definition of "fishing community" is not as clear, and has been interpreted in a variety of ways. SFA defines a fishing community as one that is "substantially dependent or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such a community" (16 UCS § 1802 (16)). However, at present it is not possible to fully access fishing communities[1] due to the dearth of appropriate data in some sectors. For example, crew members and processing plant workers are generally underrepresented in the U.S. Census. Representation of crew members in management plan analysis varies across the U.S. were permits are required in some areas though not for the northeast region. Additionally, state level data reflecting dependency on fishing, needed to determine National Standard Eight status, is not available across states limiting the analysis of fishing community dependency to federal fisheries data thus resulting in an, as yet, incomplete determination of fishing community status as defined by National Standard Eight. Given this determination, fishing communities will be referred to as communities that fish or port communities except when discussed in the context of National Standard Eight.

6.5.2 Background

There is minimal recreational effort on monkfish; therefore the major foci of this SIA are the commercial fishing businesses and families that depend on the monkfish fishery. For a complete description of the commercial monkfish fishery refer to the Monkfish FMP, Monkfish SAFE Reports for FY 2000, 2001, and the Affected Human Environment Section of this Amendment, which serves as the 2002 SAFE Report, particularly the Ports and Communities Section (Section 5.3.3). The Monkfish FMP was implemented on November 8, 1999 and contained a four-year phase in of management measures to reduce fishing effort and rebuild monkfish stocks within ten years or less. The primary management measures implemented were a limited access program with effort limitations (DAS), establishment of two management areas, target TACs, trip limits, bycatch allowances, minimum fish size, gear restrictions and spawning closures.

Year 4, starting May 1, 2002, of the FMP called for the elimination of the directed monkfish fishery and reduced bycatch trip limits, unless modified during the annual review and framework adjustment process. Framework 1 was proposed to delay the default management measures for one year, modify the management measures for Year 4 based on a review of scientific information, and to account for a Federal court order

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[1]Fishing community is a legally defined term in National Standard Eight Guidelines and therefore should only be applied to communities that fit the definition.

vacating differential trip limits for trawl and non-trawl gear. The New England and Mid-Atlantic Councils approved Framework 1, but NMFS disapproved the framework since it determined that it did not comply with the fishing mortality rate threshold specified in the original FMP. Instead, NMFS implemented an emergency interim rule (67 FR 35928, May 22, 2002) that revised the fishing mortality rate (F) criteria in the FMP to be consistent with the recommendations of SAW 34, and implemented the management measures contained in Framework 1 because, with the amendment to the F criteria in the FMP, NMFS determined that these measures were consistent with the best scientific information available.

Amendment 2 was initiated by the Council to implement any appropriate changes to the overfishing definitions and revisions to the management program by the start of Year 5, May 1, 2003. However, because NMFS could not guarantee that even if the Councils met their November 2002 target submission date, that the agency could not guarantee the measures would be implemented by the start of FY 2003. As a result, the Councils began work on Framework Adjustment 2 to the FMP. This framework was submitted by the Councils in January 2003, and was implemented on May 1, 2003 (68 FR 22325, April 28, 2003). This framework modified the overfishing reference points as recommended by SAW 34 and established an index and landings-based method for setting annual target TACs to achieve optimum yield and biomass rebuilding goals. This framework also eliminated the default management measures established in the FMP.

The goals and objectives of Amendment 2 are presented in Section 3.0 of this FSEIS. Some of the goals of this amendment are to address problems created by the implementation of the original FMP, comply with CEQ guidelines to update environmental documents, and address FMP deficiencies in meeting Magnuson-Stevens Act requirements.

The methods used to describe the social impacts of this action including comparative analysis of NMFS data and expert interviews. First, the impacts of specific measures such as trip limits, closures etc. will be discussed in general terms. Next, the distributional impacts of these measures in each monkfish dependent port will be discussed, broken down by different permit categories and gear types. The impacts of this action were measured using five general social factor categories:

- Size and demographic characteristics of the fishery-related work force residing in each area
- Cultural issues of attitudes, beliefs and values of fishermen, fishery-related workers, other stakeholders and their communities.
- Effects of proposed actions on social structure and organization
- Non-economic social aspects of the proposed action such as life-style, health, and safety.
- Historical dependence

In addition to evaluating the impacts on individuals primarily involved in the monkfish fishery, impact analysis evaluates the impact to the overall community; therefore monkfish activity is expressed as a percentage of the overall community's direct fishing activity in federal waters. For the purposes of this SIA, the community groups identified in the next section will serve as the primary scale of measurement. These are the communities that fish of most interest in the Amendment.

6.5.3 National Standard 8 discussion

National Standard 8 requires the consideration of impacts on fishery dependent communities, where a fishing community is "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." Current guidance on National Standard 8 specifies that communities are place-based: geographic units such as towns and cities that might fit the Census Bureau's definition of a "place." But actual methodological guidelines are still in the process of refinement and resources have not been directed towards the systematic and long-term collection of the kinds of baseline data needed to make such determinations in an empirically grounded way. For example, the weigh-out data and the permit files document landing and home ports, but these are not necessarily the same places where people live, where specific styles of and knowledge about fishing are practiced, or where the impacts of management are most strongly felt. It is important to note that fishing communities are not bounded or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other communities in the region.

Nevertheless, effort has been made in recent years to better identify the nature of fishing dependency on communities where people fish. Hall-Arbor et al., (2001) developed a series of regional dependency indices and port profiles for New England. Profiles for the Mid-Atlantic (McCay and Cieri 2000) are in the process of being updated. The following social and demographic profiles of monkfish ports also draw on census data in the sections on environmental justice and port information provided in the Affected Human Environment and Social Impact Assessment sections. These discussions, when considered together, attempt to provide sufficient information to understand the impact of the proposed regulations. Of importance to this particular management plan is the general trend toward neutral or positive outcomes.

The Hall-Arbor et al, (2001) report evaluated regional dependence in New England using several measurement metrics including the percentage of related occupations within a region; the percentage of fishing to total employed, and an index of alternative occupations. The distribution of primary monkfish ports by these indices sorted by the alternative occupation ratio summary is shown in Table 117. The indices themselves, though using different measurement metrics, show remarkable symmetry. Monkfish landings as a percentage of total landings are included as a point of reference to help ground the sub-regional indices at the port level. While the indices represent sub-regions within New England[2], rather than communities, they do provide a context within which

[2] Similar indices for the Mid-Atlantic have not yet been developed

port level dependence on fishing can be understood. Cape and Islands (Chatham) and Lower-Mid-Coast Maine (Portland) had the highest ratings for poor alternative employment options. This contrasts with Boston, which had the greatest occupational diversity.

	Homeport	4 YEAR AVE 99-02 (Monkfish Landings as a % of total Landings)	Sub-Region (Sub-NRR) (a)	% Related Occupations (a)	% of Total Employed (a)	Alternative Occupation Ratio Summary (a)
MA	**CHATHAM**	15	Cape and Islands	27	0.79	104
ME	**PORTLAND**	24	Lower-Midcoast ME	23	0.46	51
ME	**PORT CLYDE**	38	Midcoast ME	27	0.40	39
MA	**WESTPORT**	35	New Bedford/ South Shore	27	0.40	39
MA	**FAIRHAVEN**	11	New Bedford/ South Shore	27	0.40	39
MA	**NEW BEDFORD**	6	New Bedford/ South Shore	27	0.40	39
RI	**LITTLE COMPTON**	71	Rhode Island	24	0.31	31
RI	**TIVERTON**	64	Rhode Island	24	0.31	31
RI	**NEWPORT**	19	Rhode Island	24	0.31	31
RI	**POINT JUDITH**	11	Rhode Island	24	0.31	31
MA	**GLOUCESTER**	17	Gloucester/ North Shore	20	0.21	25
NH	**PORTSMOUTH**	28	New Hampshire Coast	8	0.09	9
MA	**BOSTON**	27	Boston	7	0.05	6
NJ	**BARNEGAT LIGHT**	30	na	na	na	na
NJ	**POINT PLEASANT**	7	na	na	na	na

Note: This table includes ports with monkfish weighout values averaging $1,000,000 between 1999 and 2002. Weighout values are listed by registered homeport for permitted vessels. Non-federal permit/no ID category are those landings values reported by federal dealers for non-federal permit holders or where not identification was reported. Na = not available. (a) Adapted from Hall-Arbor et al. 2001.

Table 117 Primary and Major Secondary Monkfish Ports by Alternative Occupation Ratio

The distribution of monkfish landings as a percent of total port landings is presented in Table 118. While this is an indicator of the port level importance of monkfish relative to all other federally regulated species, it does not represent over-all port fishing dependency in the National Standard Eight sense as state level contributions to the dependency equation do not yet exist. Nevertheless, based on the average percentage of monkfish landings, smaller primary ports appear more dependent (Little Compton, Tiverton, and Newport RI; Port Clyde, ME) while larger ports appear less dependent on monkfish (Gloucester, Chatham, Fairhaven, and New Bedford, MA; and Point Judith, RI).

	Homeport	4 YEAR AVE 99-02 (Monkfish Landings as a % of total Landings)	Sub-Region (Sub-NRR) (a)	% Related Occupations (a)	% of Total Employed (a)	Alternative Occupation Ratio Summary (a)
RI	LITTLE COMPTON	71	Rhode Island	24	0.31	31
RI	TIVERTON	64	Rhode Island	24	0.31	31
ME	PORT CLYDE	38	Midcoast ME	27	0.40	39
MA	WESTPORT	35	New Bedford/ South Shore	27	0.40	39
NJ	BARNEGAT LIGHT	30	na	na	na	na
NH	PORTSMOUTH	28	New Hampshire Coast	8	0.09	9
MA	BOSTON	27	Boston	7	0.05	6
ME	PORTLAND	24	Lower-Midcoast ME	23	0.46	51
RI	NEWPORT	19	Rhode Island	24	0.31	31
MA	GLOUCESTER	17	Gloucester/ North Shore	20	0.21	25
MA	CHATHAM	15	Cape and Islands	27	0.79	104
RI	POINT JUDITH	11	Rhode Island	24	0.31	31
MA	FAIRHAVEN	11	New Bedford/ South Shore	27	0.40	39
NJ	POINT PLEASANT	7	na	na	na	na
MA	NEW BEDFORD	6	New Bedford/ South Shore	27	0.40	39

Note: This table includes ports with monkfish weighout values averaging $1,000,000 between 1999 and 2002. Weighout values are listed by registered homeport for permitted vessels. Non-federal permit/no ID category are those landings values reported by federal dealers for non-federal permit holders or where not identification was reported. Na = not available. (a) Adapted from Hall-Arbor et al., 2001.

Table 118 Primary and Major Secondary Monkfish Ports as a % of Total Landings

When considering port level dependency on fishing it is also important to consider the extent to which the monkfish fishery is an adaptive versus a traditional fishery in New England and the Mid-Atlantic. This fishery has in recent years served to compensate for the loss of revenues in other fisheries (e.g., scallop fishery). As regulations impacting other fisheries become more stringent, it can be expected that port level reliance on monkfish may be on the rise.

6.5.4 Updated SIA Information

New social and community information has become available for use in assessing the social impacts of Amendment 2 alternatives. The research teams under Madeline Hall-Arber at MIT and Bonnie McCay at Rutgers University have completed updated port profiles and new ethnographic information for fishing ports in New England and for primary ports in the Mid-Atlantic (MARFIN Reports). Furthermore, several coastal states from Maine to North Carolina have provided updated information on Monkfish activity in both federal and state waters. Lastly, Council staff has collected qualitative information regarding potential impacts of measures and that input will be included when appropriate.

The majority of the social impact analysis for Amendment 2 builds on work from earlier Monkfish management plans such as the original FMP and Framework 1. The impact analysis for this SIA is qualitative in nature and is drawn from the analysis found in the Affected Human Environment section of this document. Data were compiled to describe the monkfish fleet and the distribution of the fishery across gear types, permit categories and port of landing. Primary and secondary community groups most substantially engaged in and dependent on monkfish were identified. Monkfish landings for homeports were examined for the time period 1999-2002 from the dealer weighout database. Primary community groups represent the most active ports in the monkfish fishery and were selected based on monkfish landings averaging $1,000,000 or greater over the four year time period. Analysis found in the Affected Human Environment section included additional secondary ports based on nearness to the $1,000,000 threshold, significant dependence on monkfish, and/or the presence of significant monkfish infrastructure. Secondary community groups consist of ports that yielded an average for the same time period of less than $1,000,000 to $50,000 (Table 119).

PRIMARY PORT COMMUNITIES

NEW BEDFORD	MA
BARNEGAT LIGHT	NJ
PORTLAND	ME
GLOUCESTER	MA
POINT JUDITH	RI
BOSTON	MA
PORTSMOUTH	NH
FAIRHAVEN	MA
NEWPORT	RI
WESTPORT	MA

SECONDARY PORTS COMMUNITIES

PORT CLYDE	ME	YORK HARBOR	ME
CHATHAM	MA	WAKEFIELD	RI
RYE	NH	CHINCOTEAGUE	VA
SCITUATE	MA	ROCKPORT	MA
TIVERTON	RI	CRISFIELD	MD
POINT PLEASANT	NJ	MANCHESTER	MA
CUNDYS HARBOR	ME	HATTERAS	NC
SHINNECOCK	NY	KITTERY	ME
PLYMOUTH	MA	OCEAN CITY	MD
SOUTH BRISTOL	ME	YORK	ME
WEST NEWBURY	MA	NEW LONDON	CT
WILMINGTON	DE	OWLS HEAD	ME
WARETOWN	NJ	DAVISVILLE	RI
CAPE MAY	NJ	SWAMPSCOTT	MA
NARRAGANSETT	RI	NEWPORT NEWS	VA
WOODS HOLE	MA	ISLIP	NY
HULL	MA	BARNEGAT	NJ
SAKONNET	RI	NEW HARBOR	ME
MONTAUK	NY	WANCHESE	NC
LITTLE COMPTON	RI	BAR HARBOR	ME
BLOCK ISLAND	RI	SOUTH DARTMOUTH	MA
FALL RIVER	MA	PROVIDENCE	RI
BARNSTABLE	MA	BELFAST	ME
ORRS ISLAND	ME	BATH	NC
HAMPTON FALLS	NH	HARPSWELL CENTER	ME
HAMPTON	NH	BIDDEFORD	ME
NANTUCKET	MA	GREENBACKVILLE	VA
WESTBROOK	ME	BOOTHBAY HARBOR	ME
HAMPTON BAYS	NY		
KINGSTON	MA		
NORFOLK	VA		

*Based on dealer weighout data

Table 119 Primary and Secondary Port Communities

While the community groups above have been identified as communities of particular interest in this amendment, it is still important to consider the impacts of the measures in the amendment across all communities. Social impacts can be defined as the changes that a fisheries management action may create in people's way of life, cultural traditions, and the community (population's structure, cohesion, stability, and character). As such, social impacts may result from changes in flexibility, opportunity, stability, certainty, safety, and other factors that are not specific to any community, but oftentimes to any individual or entity experiencing changes resulting from a fishing regulation. An example of this in gross terms is the change in the distribution of primary and secondary ports between analysis in Table 45 of Amendment 1 which covered the period 1994-1997 and the present Table 119 which covered the period 1999-2002. While major ports such as New Bedford, Gloucester, and Boston MA; Barnegat Light, NJ; Portland, ME; and Point Judith, RI were considered the top five primary ports for Amendment 1 they again fall within the primary port category with the addition of Portsmouth, NH; Newport, RI; and Westport, MA. The additions to the primary port category are smaller ports where there tends to be a higher level of overall dependency on monkfish and less overall species diversity. While 13 ports were considered secondary ports for the first analysis, over 45 qualified as secondary ports in this analysis. This rise in port dependency, at least in part, can be contributed to the need of port communities to seek out alternative fisheries in response to ever more restrictive regulations.

Information concerning the number of vessels in each monkfish permit category, for the fishing years 1999 through 2003, in each of these primary and secondary port communities is presented in Table 120. This table also shows the percentage of monkfish vessels in each fishing port, by permit category, that were considered active in the monkfish fishery. The determination of whether or not a vessel was considered active during a given fishing year was based upon if that vessel landed at least 1 lb of monkfish during that fishing year.

Daily routines, safety, occupational opportunities, and community infrastructure are examples of social impacts that can be affected by changes in management measures. Modifications to daily routines can make long-term planning difficult. New gear requirements such as netting and some equipment must be ordered months in advance resulting in changes to daily routines when these modifications cannot be met in a time and cost efficient manner. Further the cost of making such changes may prove to be a burden for some vessel owners.

Changes in management measures that limit access to fishing may increase the likelihood of safety risks. Increased risk can result when fishermen spend longer periods at sea in order to minimize steam time to and from fishing grounds, operate with fewer crew, and fish in poor weather conditions. Occupational opportunities within the fishing industry in general appear to be largely on the decline with more people leaving the industry than entering it. When the amount of fish harvested continues to decline by what ever means, cost cutting measures such as lapsed vessel insurance can be a strategy employed by vessel owners to reduce overhead even though the potential risking in doing so may be great. Fishery management measures that further reduce occupational opportunities may have profound social impacts on the future occupational viability of commercial fishing. Impacts that decrease occupational opportunities in turn can affect community infrastructure. More specifically, port infrastructure may be affected by the gradual loss of shore-based services essential to a full service working waterfront. Conversely, improved opportunities to fish may alleviate many of these less desirable impacts.

State	County	Port	Number of Permits							Percentage of Active Permits				
			Permit Type	99	00	01	02	03	Ave 99-03	99	00	01	02	Ave 99-02
MA	BARNSTABLE	CHATHAM	C	1	0	0	0	0	0.2	100%	0%	0%	0%	25.0%
			D	12	11	12	12	12	11.8	83%	91%	100%	92%	91.5%
			E	42	57	55	75	72	60.2	38%	37%	40%	32%	36.7%
	BRISTOL	FAIRHAVEN	C	13	16	10	9	7	11	100%	100%	90%	89%	94.7%
			D	3	4	3	3	3	3.2	67%	75%	67%	100%	77.1%
			E	9	18	19	22	18	17.2	56%	44%	37%	41%	44.4%
		NEW BEDFORD	A	0	1	0	0	0	0.2	0%	0%	0%	0%	0.0%
			C	105	105	112	107	110	108	98%	97%	96%	95%	96.7%
			D	39	38	42	42	39	40	92%	92%	90%	95%	92.5%
			E	38	47	60	73	62	56	55%	55%	43%	37%	47.7%
		WESTPORT	C	2	2	2	2	2	2	100%	100%	100%	100%	100.0%
			D	4	6	6	5	5	5.2	50%	50%	67%	80%	61.7%
			E	8	14	17	16	16	14.2	0%	14%	0%	6%	5.1%
	ESSEX	GLOUCESTER	B	1	0	0	0	0	0.2	0	0	0	0	0
			C	18	19	20	19	17	18.6	94%	95%	90%	95%	93.5%
			D	33	38	38	35	38	36.4	91%	87%	92%	100%	92.5%
			E	89	107	121	150	130	119	42%	37%	34%	31%	36.0%
	SUFFOLK	BOSTON	C	7	7	8	8	7	7.4	100%	100%	88%	100%	96.9%
			D	2	3	5	5	5	4	100%	67%	80%	80%	81.7%
			E	10	17	17	21	17	16.4	70%	47%	29%	19%	41.4%
ME	CUMBERLAND	PORTLAND	B	1	1	1	1	1	1	0%	0%	0%	0%	0.0%
			C	19	18	17	16	17	17.4	100%	89%	94%	94%	94.2%
			D	16	19	14	17	17	16.6	81%	84%	93%	82%	85.2%
			E	17	23	25	24	25	22.8	41%	48%	44%	38%	42.6%
	KNOX	PORT CLYDE	C	3	3	5	5	5	4.2	100%	100%	100%	100%	100.0%
			D	7	7	7	7	7	7	100%	100%	100%	100%	100.0%
			E	6	6	5	5	5	5.4	50%	33%	40%	40%	40.8%
NH	ROCKINGHAM	PORTSMOUTH	C	4	5	4	4	3	4	100%	100%	100%	100%	100.0%

			D	9	15	13	11	10	11.6	100%	87%	92%	82%	90.2%
			E	16	20	21	25	22	20.8	44%	65%	48%	32%	47.1%
NJ	OCEAN	BARNEGAT LIGHT	A	1	2	3	3	3	2.4	100%	100%	67%	100%	91.7%
			B	11	13	13	14	14	13	91%	85%	92%	93%	90.2%
			C	10	10	10	10	11	10.2	100%	100%	100%	100%	100.0%
			D	7	12	17	17	18	14.2	100%	100%	88%	94%	95.6%
			E	15	20	21	18	17	18.2	33%	40%	19%	11%	25.9%
		POINT PLEASANT	A	0	0	1	1	2	0.8	0%	0%	100%	100%	50.0%
			B	4	4	4	3	3	3.6	50%	75%	100%	100%	81.3%
			C	3	3	3	2	2	2.6	100%	100%	100%	100%	100.0%
			D	6	5	4	5	4	4.8	83%	80%	100%	60%	80.8%
			E	25	28	28	29	31	28.2	40%	32%	29%	24%	31.2%
RI	NEWPORT	LITTLE COMPTON	C	2	2	3	4	3	2.8	100%	100%	100%	100%	100.0%
			D	2	1	1	1	1	1.2	100%	100%	100%	100%	100.0%
			E	0	0	0	1	1	0.4	0%	0%	0%	0%	0.0%
		NEWPORT	B	0	0	1	1	1	0.6	0%	0%	100%	100%	50.0%
			C	7	4	5	6	6	5.6	100%	100%	100%	100%	100.0%
			D	5	5	5	7	7	5.8	100%	100%	80%	86%	91.4%
			E	8	16	18	14	10	13.2	38%	19%	28%	14%	24.6%
		TIVERTON	A	1	1	1	1	1	1	100%	100%	100%	100%	100.0%
			C	1	2	3	3	3	2.4	100%	100%	100%	100%	100.0%
			D	0	1	2	1	1	1	0%	100%	50%	100%	62.5%
			E	3	7	6	5	5	5.2	0%	14%	33%	20%	16.9%
	WASHINGTON	POINT JUDITH	A	2	2	2	2	3	2.2	100%	50%	50%	50%	62.5%
			C	25	25	24	24	25	24.6	100%	100%	100%	100%	100.0%
			D	18	18	21	20	20	19.4	83%	83%	90%	95%	88.0%
			E	36	43	40	42	40	40.2	42%	30%	33%	29%	33.2%

* Data source: Permit files and dealer weighout data for years 1999 through 2003 (year to date)

Table 120 Primary and Major Secondary Port Monkfish Permits and Percentage of Active Permits for 1999 – 2003 (year to date)

6.5.5 Social Impacts of the proposed action

Appendix I contains a summary table of the alternatives that were under consideration by the Councils, including a synopsis of the main elements of each alternative and the issues and impacts associated with each decision. The table also identifies the goals and objectives from Section 3.2 that each preferred alternative addresses. Appendix I also contains a second table, showing which alternatives were recommended by the Monkfish Committee, the Industry Advisory Panel, and proposed by the Councils in this submission. The following section contains a discussion and analysis of the social impacts of the proposed action.

6.5.5.1 Trip/possession limits for incidental catch

The Councils propose three changes to the allowable retention of monkfish incidental catch by vessels in various fisheries (see Section 4.1.1).

6.5.5.1.1 Incidental catch - 50 lbs. (tails) per day/150 lbs. maximum

Under the proposed action, vessels fishing with small mesh or handgear would be allowed to retain up to 50 lbs. (tail weight) for each 24-hour day, or partial day, to a maximum of 150 lbs.. This trip limit would also apply to vessels holding a limited access multispecies permit that are 30 feet or less in length that elect not to fish under the multispecies DAS. Vessels fishing under this trip limit are by definition not fishing on a DAS, so the day is counted from time of departure as entered in the vessel logbook or VMS.

The proposed alternative represents a potential improvement in profitability for vessels fishing with small mesh in the SFMA due to increased trip limits for incidentally caught monkfish. Vessels most affected by this trip limit change would be vessels fishing for squid, Atlantic mackerel, butterfish, and scup. This may result in positive social outcomes (e.g., increased profit and decreased discards) for some small-mesh vessels that take trips longer than one day. According to the information contained in Table 35, during the 2002 fishing year, 29-percent of limited access monkfish vessels also held a limited access squid/mackerel/butterfish permit, and 42-percent of limited access monkfish vessels also held a limited access scup permit. Further, during the 2002 fishing year, 8-percent of vessels holding an incidental monkfish permit (2,142 vessels) held a limited access squid/mackerel butterfish permit (177 vessels), and 21-percent of incidental monkfish vessels held a limited access scup permit (443 vessels).

Limited access multispecies vessels in the small vessel category could also be affected by this measure. However, there are currently only 8 vessels permitted in this multispecies permit category, and these vessels likely fish single day trips due to their small size. Thus, this measure is not likely to result in increased profitability for limited access multispecies vessels in the small vessel category. Further, because there are few reported landings of monkfish by means of handgear, vessels fishing with this gear type are not likely to receive any social benefits from this measure.

6.5.5.1.2 Incidental catch - General Category scallop dredge and clam dredge

The Councils propose applying the monkfish incidental catch limit applicable to small mesh vessels (50 lbs. tail weight/day, 150 lbs. maximum, see previous section) on General Category scallop dredge vessels and clam dredge vessels.

The alternative changes the incidental catch rate from zero to levels under consideration for vessels fishing with small-mesh gear. This improves the profitability for vessels equipped with scallop and clam dredge gear and decreases discarding, both of which have positive social impacts. According to the primary port analysis by vessel size class and gear type presented in Table 62, only vessels in the large (above 70 feet in length) and medium size classes (from 50 to 70 feet in length) would be affected by this action.

6.5.5.1.3 Incidental catch - Summer flounder vessels west of 72°30'W

The Councils propose to restore the monkfish incidental catch limit on vessels fishing for summer flounder (fluke) west of 72°30'W to five percent of the total weight of fish on board, but not to exceed a possession limit of 450 lbs. (tail wt.). Under this proposal, the boundary line between the two areas would be returned to its location prior to the groundfish interim rule, or 72°30'W, and around the eastern end of Long Island.

This alternative would enable vessels involved in the summer flounder fishery that fish in the affected area to retain more incidentally caught monkfish than allowed under current regulations (50 lbs. per trip). This would result in improved profitability and thus positive economic and social outcomes. According to the information contained in Table 35, during the 2002 fishing year, 63-percent of limited access monkfish vessels also held a limited summer flounder permit and 20-percent of vessels holding an incidental monkfish permit (2,142 vessels) held a limited access summer flounder permit (433 vessels). Therefore, the proposed action could result in improved profitability for 883 vessels, or approximately 31-percent of the vessels holding either a limited access or incidental monkfish permits.

6.5.5.2 Minimum fish size

The Councils propose setting the minimum size to 11 inches (tail), 17 inches (whole) in both areas (status quo for the NFMA, reduction from 14 inches (tail) in the SFMA (Section 4.1.2).

This alternative would result in the same minimum fish size in both management areas. It would have no social impacts in the NFMA as the size would remain the same. However, economic opportunities in the SFMA would be increased by the reduction in minimum fish size in that area. Reducing fish size would also reduce discarding in the SFMA. The social impacts of the alternative are either neutral or positive.

6.5.5.3 Closed season or time out of the fishery

The Councils propose to eliminate the requirement for limited access monkfish vessels to take a 20-day block out of the fishery. It would not affect any similar requirement on vessels with permits in other fisheries where those requirements exist, such as multispecies (see Section 4.1.3).

This alternative would provide limited access Category A and B vessels with more opportunity to utilize their monkfish DAS. Thus, this alternative would provide these vessels with more flexibility to fish for monkfish when it is most economically beneficial, resulting in some social benefits to this sector of the directed monkfish fishery. This benefit may not be appears, however, since, under current rules, owners of limited access Category A and B vessels may choose the 20-day block that is most advantageous.

6.5.5.4 Offshore SFMA Fishery

The Councils are proposing establishment of an annual enrollment program for vessels wanting to fish offshore in southern New England. Vessels electing to enroll would be subject to season, area, VMS, and gear restrictions, and a 1,600 lbs. trip limits with pro-rated DAS allocations (see Section 4.1.4).

Vessels enrolled in this program would be able to increase the amount of monkfish harvested per DAS resulting in greater profitability. However, increased profits for some vessels may be tempered by the requisite cost of VMS installation. Vessels in the large size class (those greater than 70 feet in length) are more likely to benefit given the distance to fishing grounds. Furthermore, this alternative benefits large trawl vessels by allowing them to return to a level of participation in practice prior to the implementation of the FMP, having positive economic and social consequences for vessels in this size category (Table 62 and Table 63). Therefore, the social benefits for this alternative are likely to be positive for vessels in the large size class, in particular large trawl vessels.

6.5.5.5 Modification of permit qualification for south of 38°N

The Councils propose to qualify vessels for a special limited access permit if they meet the qualification criteria described in Section 4.1.5. Vessels that qualify for a permit under this proposal would operate under the same regulations applicable to other limited access vessels, except that they would be limited to fishing for monkfish (on a monkfish DAS) south of 38°20'N.

This alternative is estimated to result in five new limited access monkfish permits. The economic analysis of this alternative (Table 115) shows that the five vessels that would qualify for limited access monkfish permits under this alternative were very dependant on the monkfish fishery prior to the implementation of the FMP. This alternative would provide these vessels with the opportunity to target monkfish in Federal waters, likely resulting in increased profitability. Therefore, the social benefits associated with alternative are likely to be positive for those affected.

6.5.5.6 Modifications to the framework adjustment procedure

The Councils propose the following additions to the list of actions that can be taken under the framework abbreviated rulemaking procedure (see Section). These three items are measures for transferable DAS, measures to protect sea turtles and other species protected under the Endangered Species and/or Marine Mammal Protection Act, and measures to implement bycatch reduction devices.

6.5.5.6.1 Implement transferable MF-only DAS

Under this proposal, the Councils could consider adopting either DAS leasing or DAS sale provisions in a future framework action. Including this item in the list of framework measures under the FMP is administrative in nature, and, therefore, will not result in any social impacts at this time. The social impacts associated with transferable DAS measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.5.5.6.2 Implement measures to minimize fishery impact on protected species

The Councils propose to include in the FMP list of actions that can be taken under the framework adjustment process measures to protect sea turtles and other species protected under the Endangered Species Act and/or Marine Mammal Protection Act, as the need arises. The list of measures would include gear-specific seasonal/area closures or gear modification. Including this item in the list of framework measures under the FMP is administrative in nature, and, therefore, will not result in any social impacts at this time. The social impacts associated with protected species measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.5.5.6.3 Implement requirements to use bycatch reduction devices

The Councils propose to add "bycatch reduction devices" to the list of measures that can be implemented under the framework adjustment process in the FMP. Including this item in the list of framework measures under the FMP is administrative in nature, and, therefore, will not result in any social impacts at this time. The social impacts associated with bycatch reduction measures considered by the Councils in the future will be fully analyzed in the associated framework action.

6.5.5.7 NAFO Regulated Area exemption program

Under this proposal, a vessel issued a valid High Seas Fishing Compliance permit under 50 CFR part 300 is exempt from monkfish permit, mesh size, effort-control, and possession limit restrictions while transiting the EEZ with monkfish on board the vessel, or landing monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area, provided the vessel complies with certain administrative and gear stowage requirements (see Section 4.1.7).

The preferred alternative for the NAFO regulated area exemption program would relieve vessels holding a High Seas Fishing Compliance Permit from the regulations governing the monkfish fishery within the U.S. EEZ. Under this program participating vessels must comply with NAFO regulations, and store their gear accordingly when transiting the U.S. EEZ. The preferred alternative will provide vessels with greater flexibility than the no action alternative. However, the social impacts of this program are uncertain since it is unknown how many vessels will participate in this program. The two factors that would affect a vessel's participation in this program are: (1) the availability of the monkfish resource in the NAFO area, and (2) the size of the vessel.

6.5.5.8 Measures to minimize fishery impact on EFH

The Councils propose two actions specifically intended to minimize the impact of the monkfish fishery on EFH (see Section 4.1.8).

6.5.5.8.1 Southern Area trawl disc restriction

The Councils propose restricting the trawl roller gear diameter to six inches maximum on vessels fishing on a monkfish DAS (monkfish-only or combined) in the SFMA.

While nearly all SFMA trawl vessels already use this gear, the proposed action could require some trawl vessels fishing under a monkfish DAS in the SFMA to purchase new trawl gear, or modify existing trawl gear, and affected vessel owners may consider this a hardship in a climate of shrinking profitability margins. Overall, however, this alternative has no social or community impact compared to no action.

6.5.5.8.2 Closure of Oceanographer and Lydonia Canyons

The Councils propose closing Oceanographer and Lydonia Canyons to vessels on a monkfish DAS to minimize the impacts of the directed monkfish fishery on deepwater corals.

Based on 2001 VTR data only 3 trips were identified as having taken place within the Oceanographer Canyon Closure area, all reported using trawl gear, and were not directed trips. For the same year, only one non-directed trip was reported as having taken place within the Lydonia Canyon Closure area. The combined revenue from these trips was estimated to be $68 thousand. Therefore, the social impacts resulting from the closure of these two areas are likely to be small in comparison to the no action alternative.

6.5.5.9 Cooperative research programs funding

The Councils propose two alternatives for facilitating and streamlining cooperative research programs under the FMP, one based on a DAS set-aside and the other on providing a limited exemption from DAS for vessels engaged in research, and adopted both. Up to 500 DAS could be distributed to vessels to engage in cooperative research projects under one of the two programs outlined below (see Section 4.1.9).

The DAS set-aside and DAS exemption alternatives would provide a means for streamlining the experimental fishing permit process for individuals interested in conducting monkfish related cooperative research activities outside the monkfish DAS program. Currently, researchers must provide information on the impacts of conducting their research activity outside the monkfish DAS program. However, the proposed DAS set-aside program and DAS exemption program would provide a means for analyzing the impacts associated with this additional monkfish effort up front, reducing the administrative burden on the researcher. Thus, because DAS set-aside and DAS exemption alternatives would reduce some of the administrative burden associated with conducting cooperative monkfish research activities, it could increase the incentive for individuals to conduct monkfish related research. The products of these research activities, such as bycatch reduction devices or improved information on the monkfish resource, would likely improve the management of the monkfish fishery, resulting in some social benefits.

6.5.5.9.1 Research DAS set-aside

A pool of 500 DAS would be set aside from the total monkfish DAS allocated to limited access vessels, excluding any carryover DAS. DAS allocations to limited access vessels would be reduced by the amount of DAS set aside (500 DAS) divided by the number of permits. NMFS will distribute DAS from the pool to vessels responding to an annual cooperative research Request for Proposals (RFP).

In terms of impacts on individual monkfish fishing effort, DAS set-aside alternative would spread the research set-aside across all limited access vessels, impacting all vessels equally. In fact, the proposed set-aside amounts of 500 DAS would result in limited access vessels giving up less than 1 monkfish DAS. Thus, the social impacts of a DAS set-aside related to reductions in fishing opportunity are expected to be negligible.

The vessels involved in the cooperative research activity would obtain social and economic benefits resulting from the additional fishing opportunities. In general, cooperative research programs funded by industry-based incentives have proven to be widely supported by fishing communities and have enhanced the relationship between industry and science sectors of the fishery. Recent cooperative research projects have fostered industry "buy-in" to the science used in support of management. Furthermore, the application for a DAS set-aside would be a competitive process similar to the research set-aside program (RSA) established for many fisheries managed by the Mid-Atlantic Fishery Management Council. Although this process may be more equitable than the DAS exemption procedures, it may add to the administrative burden of the NOAA Grants process.

6.5.5.9.2 DAS Exemption

Under this proposal, DAS set-aside under the previous program, and not distributed to vessels in response to the RFP would be used to issue DAS exemptions to vessels to conduct monkfish research or surveys. The total DAS available under this program would be the remainder of the DAS pool not distributed under the annual RFP process.

Since this measure would utilize the remaining set-aside DAS that were not distributed through the RFP process to provide additional research fishing opportunities, there would be no additional social impacts resulting from reductions in fishing opportunities. Similar to the DAS set-aside program, vessels participating in monkfish research activities under a DAS exemption would obtain both social and economic benefits resulting from the additional fishing opportunities. However, unlike the DAS set-aside program, the DAS exemption program would not be a competitive process. Requests for DAS exemptions would be reviewed and issued on a first come/first serve basis. Therefore, the DAS exemption process may be less equitable than the DAS set-aside procedures, especially for monkfish research activities that are scheduled to occur later in the fishing year.

6.5.5.10 Clarification of vessel baseline history

The Councils propose to eliminate the dual vessel-upgrading baseline (length, tonnage and horsepower) that applies on any vessel that was modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit (see Section 4.1.10). Under this proposal, the vessel's baseline would be that which applied when the vessel received its original federal permit (in any FMP where upgrading restrictions were implemented).

The proposed action, to align the vessel baseline specifications for a vessel's limited access monkfish vessel with that vessel's first Federal limited access permit, would only impact those limited access monkfish vessels that have more than one baseline upon which an upgrade in size, tonnage, and horsepower can be based, and would only affect those vessels that request such a change be made.

As noted in Section 6.4.1.10, a change in a vessel's monkfish baseline could either reduce or increase the value of the vessel depending on when the monkfish baseline is smaller or larger than the first limited access permit held by the vessel, resulting in either positive or negative social impacts. However, since the adjustment under the proposed action can only be made at the request of the vessel owner, presumably only those who would benefit would make such a request. The no action alternative could also reduce the value of a limited access monkfish vessel if the vessel owner has to relinquish one of it's limited access Federal permits (i.e., monkfish or multispecies) in order to upgrade the vessel within the established restrictions. Therefore, the proposed action is likely to have some positive social impact compared to no action.

The magnitude of these impacts is difficult to estimate since it is difficult to determine the number of vessels that are currently restricted by the existing vessel baseline provisions, and the number of vessels that may benefit from the proposed action. Furthermore, the preferred alternative only addresses multiple baselines with respect to the monkfish fishery. Although the preferred alternative would align a vessel's monkfish baseline with the baseline for it's first Federal limited access permit, a vessel could have a baseline for another limited access fishery that is not affected by this action (i.e., summer flounder, tilefish, red crab, etc.). Thus, any positive impacts related to the proposed action would only be partially realized if the vessel has an additional baseline for another fishery not affected by this action.

6.5.5.11 Social Impacts of Combined Measures

The proposed action provides opportunities to vessel owners and crew members that would not be available if the no action alternative were chosen. The social impacts of the proposed action would extend to the communities and shoreside infrastructure where these vessel owners land their fish and the communities within which they reside. This assessment of impacts suggests that there will be general tendencies toward positive social outcomes from the proposed action as compared to the no action though in some cases the benefits are modest.

6.5.5.12 Social impact of no action alternatives

The Councils propose taking no action on four measures proposed in the DSEIS. These are: the proposal to de-couple DAS usage requirements (see Section 4.2.2.1); alternatives to modify the trawl minimum mesh size (see Section 4.2.2.3); establishment of a trawl experimental fishery in the Gulf of Maine (see Section 4.2.2.12); and, alternatives to change the fishing year (see Section 4.2.2.13).

6.5.5.12.1 Impact of DAS usage no action alternative

This alternative would continue the existing effort control program in the monkfish fishery. Category C and D permits also hold either a multispecies or scallop limited access permit, and when on a monkfish DAS must also use a multispecies or scallop DAS. The social impact of this requirement remain unchanged. As with the economic impact of this alternative, the social impacts result from the decision to use a monkfish or scallop DAS to target monkfish, which are not quantifiable because of the widely varying factors affecting each operator's decision.

6.5.5.12.2 Impact of trawl minimum mesh size no action alternative

The current minimum trawl mesh size for vessels fishing on a monkfish-only or monkfish/scallop DAS is 10-inch square or 12-inch diamond codend mesh. This no action alternative would enable vessels to use existing gear and maintain current fishing strategies. As a result, the no action alternative is neutral in terms of the social impacts.

6.5.5.12.3 Impact of the experimental fishery no action alternative

Under current regulations, vessels may conduct monkfish research under an Experimental Fishery Permit, as long as the vessels comply with the research and exempted fishing provisions of the Magnuson-Stevens Act. The no action alternative would not modify this ability, and, therefore, does not have a social impact.

6.5.5.12.4 Impact of fishing year no action alternative

The alternatives that were under consideration to change the fishing year, including the no action alternative, are administrative and have minimal social impact. By maintaining alignment with the multispecies fishing year, the permit application burden on vessels and the government is minimized. In comparison to the non-preferred alternatives, the no action alternative better enables the vessel owner to plan out fishing strategies for the upcoming year, especially if the vessel has multiple DAS permits. The allocation of DAS at different times of the year for different fisheries would not only be confusing to the vessel owner, it may impact how the vessel is able to use its monkfish DAS.

6.5.6 Social Impact of non-preferred alternatives

This section describes the impacts of alternatives considered by the Councils and presented to the public in the DSEIS, but not adopted as proposed action. Since the impact of proposed measures is discussed in comparison to taking no action in Section 6.5.5, only those alternatives that contained measures other than the no action alternative are discussed in this section.

6.5.6.1 Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries

The Councils considered two alternatives, including the no action, for modifying the requirement that Category C and D vessels (vessels with a multispecies or scallop limited access permit that qualified for a monkfish limited access permit) must use either a scallop or multispecies DAS when fishing on a monkfish DAS. Under the action alternative (Alternative 1), Category C and D vessels would have had the option to use Monkfish-only DAS or combined Monkfish/Multispecies or Scallop DAS. All monkfish limited access permit holders would initially be allocated 40 monkfish DAS but DAS could be reduced to meet rebuilding objectives.

The Councils considered two approaches (Decision 1a, Appendix I): Separation of DAS by area, SFMA only (Alternative 1a), and separation of DAS by annual declaration, either area (Alternative 1b). The Councils also considered two monkfish DAS options under the proposal to separate monkfish DAS, one based on uniform ("fleet") allocations of DAS and one based on individual vessel monkfish DAS allocations using historical vessel performance in the directed fishery (Decision 1b in Appendix I). If the Councils had decided to adopt the de-coupled DAS program, they were also considering implementing transferable DAS either as a part of the Amendment 2 rule, or deferred to a future action under the framework adjustment process (Decision 1c, Appendix I). They were considering DAS transfer programs modeled after those in Multispecies Amendment 13, by lease or sale (Decision 1d, Appendix I).

The Councils ultimately selected the no action alternative based on public comments received and other reasons, as discussed in Section 4.2.2.1.

6.5.6.1.1 Separation of DAS Alternative 1

The DSEIS concluded that the economic and hence social impacts of either Alternative 1a or 1b, in relation to the no action alternative, would likely be positive or neutral relative to the no action alternative depending on whether or not a vessel owner chose to fish under separated DAS. However, based on near-unanimous comments of current participants in the fishery, the impact of increased overall effort (mainly from scallop vessels) would outweigh any benefits of increased overall fishing opportunity resulting from separated DAS. This is because an increase in fishing effort would likely result in a reduction in trip limits and/or DAS for vessels fishing in the SFMA to prevent the target TAC for this management area from being overharvested. Therefore, an influx of new fishing effort from vessels that have historically not be very dependant upon the monkfish resource, resulting from the separation of DAS, could result in negative social impacts to vessels that are currently dependant on the fishery to varying degrees. Furthermore, because the reduction in trip limits and/or DAS would occur in the SFMA, the influx of new effort would mostly impact those vessels that fish exclusively in the SFMA, and to a lesser extent, those vessels that fish in both management areas.

6.5.6.1.2 Separation of DAS Alternative la (Area based)

A declaration to separate DAS usage requirements would be required annually for the SFMA only. For those fishing exclusively in the NFMA, alternative 1a would be the same as the No Action alternative, which is the alternative being proposed in this amendment. This alternative provides an opportunity to increase the total number of DAS used in groundfish and monkfish fisheries combined. This is an advantage for the SFMA where Category C and D vessels currently target monkfish and have to use a multispecies DAS. This alternative would result in more options or flexibility that may enhance profitability. For vessels that fish exclusively in the NFMA, the economic and hence social impact effect of this alternative would be the same relative to the No Action. For vessels that fish in both areas, vessels that do not choose to have separated DAS would fish under existing management measures (no action measures) which would have no economic or social impact.

6.5.6.1.3 Separation of DAS Alternative 1b (Annual declaration)

As with Alternative 1a, impacts are largely positive in the SFMA where Category C and D vessels would be able to direct on monkfish without having to use a multispecies DAS. This alternative may similarly benefit gillnet vessels in the NFMA, where an exempted monkfish fishery is already established, but would require a trawl exempted fishery to be established for any benefit to accrue to monkfish trawl vessels in the NFMA. In both areas, vessels could elect to fish on combined DAS on a trip-by-trip basis. Because of the added flexibility, this alternative is likely to have positive social impacts for vessels fishing in either area. If the separation of DAS results in effort exceeding the maximum sustainable level under the rebuilding program, trip limits and allowable DAS could be reduced, resulting in some negative social effect on communities more dependent on the monkfish fishery, but whether this would occur cannot be predicted (especially since most vessels are not currently using more than half of their DAS allocations).

6.5.6.1.4 Fleet vs. Individual DAS allocations

If DAS are separated, monkfish DAS could be allocated as Fleet DAS (Alternative 1 Option 1a, equal number to all permit holders), or as Individual DAS (Alternative 1 Option 1b, based on past performance in the monkfish fishery). Vessels are currently allocated Fleet DAS, and this is the MAFMC's preferred alternative (the NEFMC did not identify a preferred alternative). Fleet DAS allocations inherently include some quantity of latent, or unused DAS (about half in the overall monkfish fishery) which could present an effort control problem if DAS leasing or transfer is allowed without appropriate controls to minimize the activation of such latent effort, especially during the stock-rebuilding period. On the other hand, Individual DAS allocations would minimize the amount of latent effort since the allocations would be based on actual vessel activity during the baseline period.

In terms of the social impact of the alternatives, Fleet DAS represent the least change from the current system, adjustments for DAS leasing/transfer notwithstanding, but also result in greater uncertainty about future allocations due to the potential for latent effort to be activated. In that sense, the impacts would be neutral to negative. On the other hand, latent effort represents a no-cost opportunity for vessels to increase monkfish effort as stocks rebuild to the point where some additional effort could be sustained. This provides the greatest opportunity for communities more dependent on the monkfish fishery.

Individual DAS, which are based on actual monkfish effort during a baseline period, would result in a minimal amount of latent effort being allocated to the vessels. Initial allocations, however, could be controversial, if the baseline period predates the FMP, prior to which some vessels were not required to report fishing effort or landings because they did not have federal fishing permits. While an individual DAS allocation system may favor communities where vessels were active in the fishery during the baseline period, it could be negative for those communities where vessels are permitted in the fishery but were not active during the period used to establish initial allocations.

Alternatives under consideration for transfer of DAS (by lease or sale) could have an effect on the choice between fleet or individual DAS programs. If an individual DAS program is adopted, the problems associated with leasing or transfer of latent effort are minimized since allocated effort would be similar is magnitude to actual effort used. The latent effort issue associated with fleet DAS, however, may also be mitigated by the conservation tax provisions of the transferability options.

6.5.6.1.5 Implement transferable monkfish only DAS in this amendment

The Councils considered two options for implementing a transferable monkfish-only DAS program. Alternative 1 Option 2a would implement transferable DAS (by lease or sale) as part of this amendment (effective May, 2005), while Option 2b would enable the Councils to implement such a program at a future date under the framework adjustment procedure. The Councils' selected Alternative 1 Option 2b as the proposed action.

Leasing and sale provisions would provide the most flexibility to vessels, enabling those who wanted to expand their participation in the fishery to do so, while providing some economic return to those vessels that want to reduce or eliminate their monkfishing activities. Under a leasing program, the leasing vessel would still retain the long-term rights (and DAS allocations), and these impacts are likely to be less pronounced than under a sale provision, where the transfer of DAS is permanent. While sale of DAS may provide an economic return to selling vessel owners, the impact of departure from the fishery on crew and other members of the community are uncertain.

6.5.6.1.6 On the other hand, having the ability to increase monkfishing activity through the purchase or leasing of DAS provides the acquiring vessel greater flexibility and opportunity to tailor its monkfishing activity to the level best suited to its needs. Thus, those communities where acquiring vessels operate (and crew on such vessels) would realize a positive effect of the transfer program. However, because such a program was only recently implemented under Amendment 13 to the Northeast Multispecies FMP, the actual impact cannot be accurately predicted, nor can the net social impact of crew and community benefits (of acquiring vessels) compared to losses (of selling vessels' crew and communities) be predicted. This uncertainty and other potential issues that have been raised about DAS transfer programs suggest that postponing the adoption of a leasing program until a future date (through a framework adjustment) would have less negative social impacts than if it were adopted upon implementation of this amendment. This rationale is also the basis for the Councils' preference to adopt transferability under a future framework adjustment procedure.

As discussed in the previous paragraphs, the Councils considered allowing vessels to lease or sell monkfish DAS either by framework adjustment at a future time, or upon implementation of this amendment. The DAS leasing and sale alternatives considered were modeled after similar programs proposed by the NEFMC in Amendment 13 to the Multispecies FMP. A quantitative analysis of the social impacts of these alternatives is not possible at this time, but a qualitative assessment based on the discussion in Amendment 13 is provided below.

The rationale for the DAS program in Amendment 13 is to provide flexibility for fishermen to adapt to the proposed DAS reductions that may make some vessels unprofitable. Similarly, the DAS sale provisions are designed to provide economic opportunity and flexibility while achieving some long-term reduction in fishing effort through the removal of active and inactive effort (via the conservation tax). While Amendment 2 does not contain either effort reduction proposals or the goal of long-term effort reduction that are integral to Amendment 13, the leasing and sale alternatives may still provide fishermen the opportunity and flexibility that those programs represent.

The Amendment 13 analysis concluded that "a leasing program offers an option for some vessels to temporarily increase the number of DAS they may fish by leasing the DAS from another vessel that chooses not to fish them. ... If a particular community is home to a large number of vessels that can participate, this program may provide for the sustained participation of the community in the groundfish [or monkfish, in this case] fishery." The analysis also noted that "the selection of a mechanism to ensure conservation-equivalency is important and may determine the extent to which some vessels are able to participate in the DAS leasing program."

From Amendment 13:

> The following gives some indication of the possible social impacts from leasing DAS. This analysis is based on part on the predicted outcomes from economic modeling ... further aggregated by port, state, and vessel size to give an indication of the differential effects of DAS leasing within the groundfish industry. This analysis should be interpreted as an indication of the *direction* of pressures or trends, rather than a precise estimate of impacts. The economic model itself is highly stylized and makes a number of theoretical assumptions about perfect markets (such as the overall ability and willingness to trade and the full information to do so, and simultaneous execution of all trades) that are not reasonably expected to occur. There are also a number of reasons to expect, based on anthropological perspectives, that such trading will not take place as economic modeling may predict. Anthropological studies have demonstrated repeatedly that for many fishermen and fishing families, a commitment to fishing is based not solely on income or profit maximization but rather on fishing as a way of life.... Other studies have shown that many fishing businesses are family-run enterprises where income pooling and other forms of resource sharing mitigate against the more traditionally-capitalist assumptions about firms in economic analyses.

> The economic modeling assumes that a vessel owner would only lease DAS if the income from leasing is more than the expected income from fishing those DAS; in other words, the impacts from such a leasing arrangement are expected to be positive, or at least no worse than status quo. Given the coupling of this alternative with other alternatives in order to meet conservation neutrality, leasing would at best mitigate the negative impacts from the overall reduction in fishing activity. However, since the income accrues to the owner of the vessel, crew members on vessels that lease DAS away may see a negative impact to income, depending on to what extent the vessel engages in alternative fishing activities (about which the model makes no predictions). Alternatively, crew on vessels that lease DAS in may see positive impacts from increased fishing activity. Changes in landing patterns that could occur with net outflows of DAS from particular ports (as indicated below) could have negative impacts on buyers and processors, depending again on to what extent vessels engage in other fishing activities. Moreover, the social impacts from policy changes extend beyond changes in income. Studies on the social ramifications of ITQ's (though fundamentally different from the policy proposed here since DAS are only leased and not permanently sold) have, for example, pointed to the significant impacts on social relations that stem from the modification of fishing activity. Moreover, such ITQ studies have pointed to the ramifications of changing market shares that enable the domination of particular segments of the industry over others without further protective legislation.
>
> In terms of the distributional effects within the groundfish industry, the economic modeling indicates a movement of DAS from large/medium to small vessels.... For all size categories, there is a movement to vessels more dependent on groundfish income, though this is more pronounced for the larger vessels. At the state level ..., the influx of DAS is primarily to Massachusetts, which is also the state with the highest groundfish income from the vessels modeled. Maine, though with the second highest income and with income that comes from vessels dependent or highly dependent on groundfish, sees significant loss of DAS. Rhode Island also shows significant loss of DAS. It is therefore expected that the negative impacts (as detailed above) from DAS leasing would be felt most there. At the port level, ports such as New Bedford and Gloucester see a net gain of DAS while ports such as Portland, Point Judith, Newport, and Hampton might see a net loss. (*Amendment 13, Section 5.6.2.2.2*)

In the context of the monkfish fishery, therefore, DAS leasing is likely to result in the shift in distribution of DAS used in the fishery among communities and vessel classes, but the magnitude and direction cannot be predicted. Under a DAS sale program, similar changes would also likely occur, but on a more permanent basis.

6.5.6.2 Alternatives to the 50 lbs./trip incidental catch limit

The Councils considered three alternatives for the 50 lbs./trip incidental catch limit; the no action alternative, a 50 lbs./day up to 150 lbs. maximum possession limit (Alternative

2), and a 50 lbs./day up to 500 lbs. maximum possession limit (Alternative 3). The Councils recommended Alternative 2 as the proposed action, rejecting both the no action alternative, and Alternative 3.

The no action alternative would have kept the present incidental allowance of 50 lbs. per trip in place, resulting in no social impacts with respect to the baseline. However, Alternative 3 would have enabled vessels to retain a higher amount of monkfish as incidental catch than the proposed action. Thus, Alternative 3 could result in greater positive social outcomes (e.g., increased profit and decreased discards) for some vessels, particularly squid freezer vessels that take trips of 3-10 days in duration, than the proposed action or the no action alternative.

6.5.6.3 Minimum trawl mesh size on directed MF DAS

The Councils presented three alternatives for minimum trawl mesh size while a vessel is on a monkfish DAS, and adopted Alternative 1, the no action alternative. Alternative 2 proposed that limited access vessels fishing under a monkfish DAS would be required to use 12-inch square mesh in the codend, and 12-inch diamond mesh in the belly and wings of the net. Alternative 3 proposed that limited access vessels fishing under a monkfish DAS would be required to use 12-inch square mesh in the codend only. Under these two action alternatives, Category A and B trawl vessels on a monkfish DAS would have to use the larger mesh, as would limited access scallop vessels while on a monkfish DAS (since they are prohibited from using a dredge on a monkfish DAS). If monkfish DAS were separated from multispecies DAS, then the selected alternative would also have applied on multispecies vessels fishing on a monkfish only DAS. When on a combined monkfish/multispecies DAS, if DAS were separated, the Councils considered requiring either multispecies regulated mesh (no action alternative), or one of the other alternatives described in this section. Further, for mesh sizes larger than 10 inches, the Councils proposed using the nearest metric equivalent for specification in the regulations. Large mesh sizes are manufactured in Europe under a metric system and measured between the knots, while U.S. mesh-size regulations are expressed in inches between the knots.

The proposed action would have no negative social impacts since it would not change minimum mesh size restrictions for vessels fishing under a monkfish DAS. Conversely, the implementation of an alternative that would increase the minimum trawl mesh size in the codend or entire net would require owners of monkfish trawl vessels with non-conforming gear to purchase and install trawl nets that comply with the new restrictions. While replacing an entire net may require a substantial initial expenditure, vessels routinely replace codends. The cost of gear may be offset by the benefits of increased fishing opportunity and increased yield per recruit associated with using larger mesh nets.

Vessels that fish only in the NFMA would likely not be impacted by a change in the minimum mesh size since there is currently monkfish trawl exemption area in the NFMA. As a result, these vessels would likely continue to fish for monkfish under a multispecies DAS, or under a combined multispecies/monkfish DAS, with minimum mesh regulated by the multispecies FMP. However, there is an option under the minimum mesh alternatives to require the increased minimum mesh size under combined DAS. If this option is implemented, vessels that choose to fish under a combined DAS (to retain full monkfish allowance if DAS are separated) in the NFMA would also be required to purchase trawl mesh that conforms to the increased minimum monkfish mesh size.

In summary, the proposed action would result in no additional costs, and therefore, would likely not have any significant negative social impacts. However, an increase to the minimum mesh size (codend or entire net) would result in additional costs to vessels using non-conforming gear, resulting in some negative social impacts. However, there is insufficient data available on the mesh size being used by vessels targeting monkfish (from observer data and VTR data) to determine the extent of these impacts. Furthermore, the increased yield per recruit, reduced discards of small monkfish and other species, and the increased opportunity (associated with separated DAS) may actually result in positive social effects despite the short-term economic costs.

6.5.6.4 Minimum fish size

The Councils considered four alternatives for minimum fish size, including the no action alternative (Alternative 1), uniform minimum tail size (Alternative 2) with two size limit options (Option 1 = 11-inch tail, Option 2 = 10-inch tail), and eliminating the minimum size (Alternative 3). One of the alternatives, Alternative 4, was contingent upon the adoption of a monkfish-only DAS program, and would apply a different minimum size when a vessel is on a monkfish-only DAS. The Councils are proposing that there be a uniform 11-inch minimum tail size (17-inch whole) for both management areas (Alternative 2, Option 1).

6.5.6.4.1 Minimum fish size Alternative 1 (no action)

The no action alternative would maintain the current minimum size limits of an 11-inch tail size in the NFMA, and a 14-inch tail size in the SFMA. Compared to the proposed action, vessels in the NFMA would continue to be subject to the same minimum fish size. However, vessels fishing in the SMFA would continue to have a more restrictive minimum fish size than vessels fishing in the NFMA under the No Action Alternative, potentially resulting in a higher discard rate for vessels fishing in the SFMA, and a greater loss in revenues due to the more restrictive minimum fish size. This could continue to foster feelings if inequity between vessels that fish exclusively in the SFMA, and those vessels that fish primarily in the NFMA.

6.5.6.4.2 Minimum fish size Alternative 3 (no minimum size)

None of the action alternatives would change the catch targets or DAS/trip limit allocations, but would have the effect of converting some monkfish discards to landings, thereby minimizing bycatch. Alternative 3 would eliminate the minimum fish size limit resulting in the greatest potential economic flexibility and would eliminate regulatory discards due to minimum size restrictions. Thus, the social impacts of Alternative 3 are either neutral or positive.

6.5.6.4.3 Minimum fish size Alternative 4 (if DAS are separated, 14" tail/21"whole)

The 14-inch tail size limit proposed under Alternative 4 would be the same as current regulations for the SFMA. As a result, vessels fishing in the SFMA would not have to adjust their current fishing practices. For the NFMA, this alternative would result in an increase to the current minimum fish size, requiring vessels to discard monkfish that they were previously allowed to land. Thus, the social impacts of this alternative would likely be neutral for the SFMA and negative for the NFMA.

6.5.6.5 Closed season or time out of the fishery

The Councils considered three alternatives for closed seasons (spawning closures, or blocks of time out of the fishery) including no action, and propose Alternative 2, eliminating the closed season requirement. Under Alternative 3, the current 20-day block requirement would be extended to 40 days, although the days could be taken in two 20-day blocks within the months specified under the current regulations. The Councils also considered, if DAS were decoupled, requiring all limited access permit vessels, including Category C and D permits with scallop limited access permits, would be required to take the block of time out of the monkfish fishery under either Alternative 1 (no action, 20-day block) or Alternative 3 (two 20-day blocks).

Alternative 1 (no action) would retain the current requirement for limited access Category A and B vessels to take a 20-day block of time out of the monkfish fishery from April 1 through June 30 of each calendar year. Limited access Category C and D vessels are currently not required to take a monkfish spawning block since they are required to take a 20-day block out of the Northeast multispecies fishery from March 1 through May 31 of each calendar year, if they hold a limited access Northeast multispecies permit. This alternative would not incur any additional regulatory costs since it does not change the current monkfish spawning block requirements. As such, this alternative would likely not incur any additional social impacts.

Alternative 3 would increase the current 20-day spawning block to 40 days. Under this alternative, vessel owners may choose to take the entire 40-day block at one time, or split it into two 20-day blocks. This alternative would greatly impact monkfish trip scheduling and planning, leaving vessels with few opportunities to target monkfish during one of the peak monkfish fishing seasons. The social impacts of blocks of time out of the fishery are difficult to determine since vessels may engage in other fisheries while under a monkfish spawning block, and may retain monkfish within the bycatch limits established for fishery or gear type. However, because this alternative further restricts limited access monkfish vessels during one of the peak fishing seasons, Alternative 3 is expected to have greater social impacts than Alternative 1.

Under this management measure, there is an option to require all limited access monkfish vessels in the spawning season restrictions under either Alternative 1 or Alternative 3 if DAS are separated. Currently, limited access Category C and D vessels are not required to take a monkfish spawning block. Category C and D vessels with a limited access multispecies permit are required to take a 20-days out of the Northeast multispecies fishery, but Category C and D vessels with a limited access scallop permit are currently not required to take type of spring spawning block.

The option to include all limited access monkfish vessels in the spawning season restrictions may reduce social tensions between owners of Category A and B vessels and owners of Category C and D vessels resulting from feelings that Category C and D vessels have been given an unfair advantage. Scallop vessels are unlikely to target monkfish during the spring since this is the start of the scallop fishing year. As a result, the social impacts to limited access scallop/monkfish vessels resulting from Alternatives 1 or 3 would likely be minimal. Furthermore, limited access Category C and D vessels with a limited access multispecies permit are not expected to incur additional social costs under this option, since these vessels are currently not able to fish under a monkfish DAS during their 20-day multispecies spawning block.

6.5.6.6 Offshore SFMA Fishery

The Councils considered two alternatives for establishing an Offshore Fishery Program in the SFMA, including the no action alternative. The Councils are proposing establishment of an enrollment program for vessels wanting to fish offshore in southern New England, Alternative 2. Within Alternative 2, however, the Councils considered, but rejected options for the area covered under this program (Area Option 2), and for the applicable trip limits and associated DAS (DAS/Trip Limits Option 1).

The No Action alternative would continue to restrict the ability of vessels to prosecute a fishery in the offshore canyon areas; a fishery that previously occurred prior to the implementation of the FMP. Thus, the continued forgone opportunity to prosecute this offshore fishery under the no action alternative could result in some negative social impacts compared to the proposed action.

Area Option 2 would have established the boundary of the for the offshore fishery as a the area north of 38° N and offshore of the Loligo squid exemption line to its intersection with the northern boundary of the monkfish/skate trawl exemption area at 40o10' N, then eastward along the trawl exemption boundary. This area option would have excluded potentially productive deep water canyon areas from the Offshore Fishery Program, reducing the fishing opportunities available to vessels participating in this program. The Offshore Fishery Program as a whole is expected to result in positive social impacts. Therefore, one could expect that the social benefits of this Offshore Fishery Program under Area Option 2 would be less than under Area Option 1.

The DAS/Trip Limit Option 1 would have enabled participating vessels to chose a trip limit/DAS ratio of 1:2, 1:3 or 1:4, versus having a fixed trip limit of 1,600 lbs. tail weight (with DAS adjusted accordingly). This option would have provided participating vessel owners with the flexibility to choose the ratio that would maximize their profitability, potentially resulting in greater social benefits as compared to DAS/Trip Limit Option 1.

6.5.6.7 Modification of permit qualification for south of 38°N

The Councils took to public hearings four alternatives that would revise the limited entry qualification periods for certain vessels that did not qualify for a permit under the original FMP, plus no action (Table 121). The Councils are proposing Alternative 3 in this amendment. Under the no action alternative, no additional vessels would qualify for a monkfish limited entry permit, since the permit appeals period has ended. The landings qualification criterion would remain the same as in the original FMP, that is 50,000 lbs. (tail wt.) for a Category A or C permit, and 7,500 lbs. (tail wt.) for a Category B or D permit, except that landings must have occurred south of 38°N.

	Qualification period – four years prior to:		**Estimated qualifiers**
Alternative 1	June 15, 1998	(full year)	7
Alternative 2	June 15, 1997	(full year)	3
Alternative 3	June 15, 1998	(March 15 – June 15)	5
Alternative 4	June 15, 1997	(March 15 – June 15)	3
Alternative 5 (no action)	February 27, 1995		N/A

Table 121. Four alternative limited access permit qualification periods for vessels fishing south of 38°N, plus no action. The Councils are proposing Alternative 3.

The information contained in Table 121 shows the number of vessels estimated to qualify for new limited access permits under each alternative considered. For all of these alternatives, except the no action alternative, the social benefits for those affected would likely be positive. Alternative 1 would result in the greatest overall social benefit since it would provide positive benefits to a greater number of vessels than the other alternatives. Conversely, the no action alternative would continue to limit the fishing opportunities of vessels that would qualify for a limited access monkfish permit under the proposed action, or one of the other proposed action alternatives, with some potential negative social effects.

6.5.6.8 EFH Alternative 4 Options 1 and 2 (Monkfish trawl configuration)

The Councils considered 3 alternative trawl configurations, including the no action Option 1, specifically designed to minimize the impact of the monkfish fishery on EFH for other groundfish species if DAS usage requirements were separated. Under Option 2, the Councils considered six individual elements that could be taken together or separately, which are described in Section 4.2.2.9.3, and sought public comment on the specific components. However, this option would only be considered if DAS were de-coupled. The intent of this alternative was to increase efficiency of bottom trawls for catching monkfish on muddy bottom and reduce the likelihood that they will be used in hard bottom areas that provide EFH for other groundfish species. The Councils adopted Option 3, to establish a maximum disc diameter of 6-inches in the SFMA.

Any change in gear requirements under Option 2 would require the purchase of new equipment for use during monkfish-only DAS trips. Although vessel owners are often required to purchase new gear for a variety reasons (wear, damage, etc.) some vessel owners may consider the purchase of new fishing gear a hardship in a climate of shrinking profitability margins. Conversely, under the No Action alternative, vessels would not be required to conform with new gear requirements. Thus, no social impacts would result from the No Action alternative.

6.5.6.9 EFH Alternative 5C (up to 12 large, steep-walled canyons closures)

The Councils considered two closure options to minimize the impacts of the directed monkfish fishery on deepwater corals and adopted Alternative 5AB, which consists of a closure of Oceanographer and Lyndonia Canyons. The Councils did not adopt Alternative 5C, which proposed to close waters above up to 12 large canyons from Norfolk Canyon to the Hague Line. Alternative 5C would have closed a larger area to monkfish vessels than Alternative 5AB. Thus, the social impacts resulting from the closure of this area would likely be greater than the impacts resulting from Alternative 5AB, based on the affected area alone.

According to 2001 VTR data, only 116 trips were identified as having taken place within the Large, Steep-Walled Canyon Closures of which 5 were found to be directed trips. Conversely, only 3 trips were identified as having taken place within the Oceanographer Canyon Closure area, and only one trip was reported to have taken place within the Lydonia Canyon Closure area. None of the trips taken in either of these closure areas were directed trips. Thus, based on past effort in the offshore canyon areas, Alternative 5C would likely have greater social impacts than Alternative 5AB.

6.5.6.10 NFMA Monkfish trawl experimental fishery

The Councils considered two alternatives, including the no action alternative, for a two-year monkfish trawl experimental fishery for the purpose of establishing a trawl exempted fishery in the NFMA to streamline the process of determining where, when and under what gear restrictions trawl vessels could target monkfish while on a monkfish, but not a multispecies DAS. However, the Councils determined that this alternative was no longer necessary for the reasons presented in Section 4.2.2.12.

This alternative would provide additional opportunity for vessels to fish for monkfish in the NFMA through participation in a cooperative research project. Further, information gathered from this research could be used to establish an experimental monkfish trawl fishery in the NFMA. Under current regulations, there is no exempted monkfish trawl fishery in the NFMA, and therefore, there is no opportunity for trawl vessels to use monkfish-only DAS in this area. Thus, because this alternative could lead to increased fishing opportunities, it would have some social benefits. However, because this alternative would utilize up to 300 of the 500 monkfish DAS set aside for monkfish research activities, it could prohibit other much needed monkfish research from being conducted, resulting in some social costs.

6.5.6.11 Change fishing year

The Councils (NEFMC and MAFMC) proposed changing the monkfish fishing year in this amendment to be consistent with any changes under Multispecies Amendment 13, and considered three alternatives. Under Alternatives 2, 3 and 4, the fishing year would be changed to calendar year, October – September, or July – June, respectively.

The three alternatives to change the fishing year would likely result in some level of social impacts since Amendment 13 to the Northeast Multispecies FMP made no changes to the multispecies fishing year, and the monkfish fishing year would no longer be aligned with the multispecies fishing year, potentially making the permit renewal process more cumbersome. In addition, a change in the fishing year would impact a vessel owner's planning of fishing activities for the upcoming year, especially if a vessel is receiving different DAS allocations at different times of the year. These impacts would be more substantial if monkfish DAS are not separated from Northeast multispecies and scallop DAS. Furthermore, the social impacts associated with Alternative 2 may be slightly less than Alternatives 3 and 4 since Alternative 2 would align the monkfish fishing year with the fishing years of several other species managed by the Mid-Atlantic Fishery Management Council (i.e., summer flounder, scup, black sea bass, squid, etc.), making the planning of fishing activities slightly easier.

6.5.6.12 DAS prorating alternatives if the fishing year is changed

Since DAS are allocated on a fishing year basis, if the Councils had decided to change the fishing year in this amendment, they would have had to adopt a procedure to allocate DAS for the partial years during the transition period. The Councils considered two alternatives are based on the prorating alternatives under consideration in Multispecies Amendment 13, adapted to the different implementation schedule of this amendment. The only difference between the alternatives is that Alternative 2 provides for a longer transition period by extending the proration period into the 2006 fishing year. As a result, Alternative 2 may provide vessels with greater flexibility to maximize their economic opportunity. Therefore, Alternative 2 may have a slight advantage from a social impact perspective than Alternative 1 due to the increased flexibility.
Since the Councils took no action to change the monkfish fishing year, these administrative alternatives are irrelevant.

6.6 Cumulative Effects

The purpose of this section is to summarize the incremental impact of the proposed action on the environment resulting when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes them.

6.6.1 Background

The National Environmental Policy Act (NEPA) requires that cumulative effects of "past, present, and reasonably foreseeable future actions" (40 CFR § 1508.7) be evaluated along with the direct effects and indirect effects of each proposed alternative. Cumulative impacts result from the combined effect of the proposed action's impacts and the impacts of other past, present, and reasonably foreseeable future actions. These impacts can result from individually minor but collectively significant actions taking place over a period of time. The Council on Environmental Quality (CEQ) directs federal agencies to determine the significance of cumulative effects by comparing likely changes to the environmental baseline. On a more practical note, the CEQ (1997) states that the range of alternatives considered must include the "no-action alternative as a baseline against which to evaluate cumulative effects." Therefore, the analyses in this document, referenced in the following cumulative impacts discussion, compare the likely effects of the proposed actions to the effects of the no-action alternative.

CEQ Guidelines state that cumulative effects include the effects of all actions taken, no matter who (federal, non-federal or private) has taken the actions, but that the analysis should focus on those effects that are truly meaningful in terms of the specific resource, ecosystem and human community being affected. Thus, this section will contain a summary of relevant past, present and reasonably foreseeable future actions to which the proposed alternatives may have a cumulative effect. This analysis has taken into account, to the extent possible, the relationship between historical (both pre- and post-FMP) and present condition of the monkfish population and fishery, although significantly less is known about the population and the fishery prior to the implementation of the FMP and other management actions affecting the fishery (particularly Multispecies Amendments 5 and 7 and Sea Scallop Amendment 4). The time frame for this analyis, therefore, is primarily the 1980's and 1990's for historical information, although trawl survey data extending to the 1960's is considered, and approximately 5-10 years for reasonably foreseeable future actions affecting the fishery. The geographic scope of the analysis is the range of the monkfish fishery in the EEZ and adjacent fishing communities, from the U.S.-Canada border to, and including North Carolina.

The cumulative effects analysis focuses on five Valued Environmental Components (VEC's):

1. target species (monkfish)
2. non-target species (incidental catch and bycatch)
3. protected species
4. habitat, and

5. communities.

The cumulative effects determination on these VEC's is based on the following analyses: (1) the discussion in this section of non-fishing actions occurring outside the scope of this FMP; (2) the analysis of direct and indirect impacts contained in the Environmental Consequences section of this SEIS (Section 6.0) and summarized in this section (Sections 6.6.4 and 6.6.5); (3) the summary of past, present and future actions affecting the monkfish fishery; and (4) the cumulative effects of the alternatives provided in Table Table 124 of this section.

NOAA Fisheries staff determined that the 5 VECs (target species, non-target species, protected species, habitat and communities) are appropriate for the purpose of evaluating cumulative effects of the proposed action based on the environmental components that have historically been impacted by fishing, and statutory requirements to complete assessments of these factors under the Magnuson-Stevens Act, Endangered Species Act, Marine Mammal Protection Act, Regulatory Flexibility Act, and several Executive Orders. The VECs are intentionally broad (for example, there is one devoted to protected species, rather than just marine mammals, and one on habitat, rather than Essential Fish Habitat) to allow for flexibility in assessing all potential environmental factors that are likely to be impacted by the action. While subsistence fishing would ordinarily fall under the "communities" VEC, no subsistence fishing or Indian treaty fishing take place in the area managed under this FMP.

The vessels participating in the monkfish fishery must comply with all federal air quality (engine emissions) and marine pollution regulations, and, therefore, do not significantly affect air or marine water quality. Consequently, the management measures contained in Amendment 2 would not likely result in any additional impact to air or marine water quality.

6.6.2 Overview of the proposed action alternatives

This amendment is designed to achieve a number of goals and objectives as outlined in Section 3.0, consistent with the monkfish stock-rebuilding goals established by the FMP, adopted in 1999 and amended in Framework 2 in 2003. The purpose and need for this amendment is summarized in Section 2.12. The proposed action and alternatives considered but not adopted are outlined in Section 4.0, and the direct and indirect impacts on the environment are analyzed and discussed in Section 6.0. A summary of the alternatives (proposed and non-preferred) and associated impacts and issues as presented in the DSEIS is provided in Appendix I.

In summary, as stated in the Goals and Objectives, the proposed actions are primarily designed to address management problems and issues that have arisen since implementation of the FMP, and to comply with applicable laws such as NEPA and the Magnuson-Stevens Act. In some instances, such as Essential Fish Habitat and bycatch minimization requirements, courts have found the FMP to be out of compliance with some elements of applicable law, and have ordered the Councils to remedy the situation which they are doing in this amendment. This amendment also addresses problems and issues raised the public during the amendment scoping process. In addition, some proposals address NMFS strategic objectives of streamlining the management process and reducing administrative burdens on the agency and public. These actions do not modify the stock rebuilding elements of the original FMP, as modified in Framework 2.

6.6.3 Summary of non-fishing actions and their effect

Following is an assessment of non-fishing impacts on fish habitat and fishery resources. For fish habitat, non-fishing effects have been reviewed in the Essential Fish Habitat Amendment for Monkfish prepared by the NEMFC (Amendment 1 to the Monkfish FMP). Table 122 below, taken from that document, represents the review of the EFH Technical Team of the potential effects of numerous chemical, biological and physical effects to riverine, inshore and offshore fish habitats. Table 122 exhibits twelve representative classes of chemicals, three categories of biological and nineteen types of physical threats, which are categorized as low, moderate or high threats to habitat, based on their geographic location—riverine, inshore and offshore. In general, the closer the proximity to the coast, i.e., close to pollution sources and habitat alternations, the greater the potential for impact.

Riverine and inshore habitats were generally categorized as moderate to high threats whereas the offshore areas were low to moderate. For the offshore area, with the exception of events such as oil spills and algae blooms, which can spread over large areas, moderate effects were generally localized to a well-defined and relatively small impact area such as oil/gas mining and dredged material disposal. Thus, only small portions of fish stocks would potentially use these sparsely located areas and would be adversely affected. For example, dredged material disposal sites, usually about 1 nm^2 in size, are managed by the U.S. Army Corps of Engineers and the U.S. EPA to minimize physical effect to the defined disposal area and allow no chemical effects at the site based on stringent sediment testing.

THREATS		RIVERINE	INSHORE	OFFSHORE
Chemical				
	oil	M	M	M
	heavy metals	M	M	M
	nutrients	H	H	L
	pesticides	M	M	L
	herbicides / fungicide	M	M	L
	acid	H	M	
	chlorine	M	M	
	thermal	M	M	
	metabolic & food wastes	M	M	
	suspended particles	M	M	L
	radioactive wastes	L	M	M
	greenhouse gases	M	M	M
Biological				
	nonindigenous / reared species	M	M	M
	nuisance / toxic algae	M	H	M
	pathogens	M	M	M
Physical				
	channel dredge	M	H	
	dredge and fill	H	H	
	marina / dock construction	M	H	
	vessel activity	M	H	L
	erosion control			
	bulkheads	M	M	
	seawalls		M	
	jetties		M	
	groins		M	
	tidal restriction	M	H	
	dam construction / operation	H	M	
	water diversion			
	water withdrawal	H	M	
	irrigation	M	M	
	deforestation	H	M	
	mining			
	gravel/mineral mining	M	M	M
	oil/gas mining	L	M	M
	peat mining	L		
	debris	M	M	M
	dredged material disposal	L	M	M
	artificial reefs	L	M	M

Table 122- Potential non-fishing threats to fish habitat in the New England region prioritized within regions (H = high; M = moderate; L = low)2

[1] From NEFMC (1998)

[2] Prioritization developed by compilation of *EFH Technical Team* survey

For fishery resources, there are several non-fishing threats that could have a direct and/or indirect impact on monkfish stocks. Several of the items identified as non-fishing threats to fish habitat, identified in Table 122 could also pose a threat, such as the oil spills, pesticides, and radioactive wastes. Generally the closer the proximity of monkfish stocks to the coast, the greater the potential for impact (although predation, a non-fishing impact, would be one threat that would occur everywhere). Monkfish reside or migrate through both inshore and offshore areas at different stages of their lives and during different seasons throughout the year. In the offshore areas, effects of non-fishing activities would likely be low because the localized nature of the effects would minimize exposure to organisms in the immediate area.

An additional inshore threat of note would be the effect on fishery resources presented by power plants. The operations of power plants are thought to be especially of consequence to fish eggs, larvae and juveniles. Entrainment, or intake of cooling seawater for the purposes of cooling power plant reactors, is known to draw in eggs and larvae and, therefore, could have a negative impact on some fishery resources that spawn in areas in close proximity to active power plants. An additional threat associated with power plants is the discharge of warm water. This thermal discharge is believed to have a negative impact on reproduction capability and recruitment of affected fishery resources. Since monkfish spawning and larval stages occur primarily in the offshore environment, this threat is not as significant as it is for other fish stocks, such as winter flounder.

Other future non-fishing threats to fishery resources could include global warming and siting of wind farms in the coastal or offshore environment. The effects of global warming and rising sea temperature on the life cycles and distribution of fishery stocks are uncertain and, therefore, could not be incorporated into this assessment. The possibility of windmill construction in marine waters for the purposes of harnessing alternative means of energy could also have an impact on fishery resources, especially as it relates to disruption of habitat. This is the subject of a forthcoming EIS being prepared by the Army Corps of Engineers. The impacts of this project to the fisheries are yet to be determined but are likely to be localized to the vicinity of the projects.

6.6.4 Summary of fishing gear effects on fish habitat

Appendix II contains the gear effects and adverse impacts determination analysis, based on the results of the Councils' Gear Effects Workshop and information provided by the NEFMC Habitat Technical Team, as well as a report from the National Research Council on the "Effects of Trawling and Dredging on Seafloor Habitat". This latter study determined that repeated use of trawls/dredges reduce the bottom habitat complexity by the loss of erect and sessile epifauna, smoothing sedimentary bedforms and bottom roughness. Such activity, when repeated over a long term also results in discernable changes in benthic communities, which involve a shift from larger bodied long-lived benthic organisms for smaller shorter-lived ones. This shift also can result in loss of benthic productivity and thus biomass available for fish predators.

Thus, such changes in bottom structure and loss of productivity can reduce the value of the bottom habitat for demersal fish. These effects varied with sediment type with lower level of impact to sandy communities, where there is a high natural dynamic nature to these bedforms, to a high degree of impact to hardbottom areas such as bedrock, cobble and coarse gravel, where the substrate and attached epifauna are more stable. Table 39 in Appendix II indicates for all demersal life stages, monkfish inhabit bottom habitats with substrates of sand-shell mix, algae covered rocks, hard sand, pebbly gravel or mud. Fishermen in most areas report that their monkfish effort is predominately directed in mud-bottomed areas.

Use of trawls and dredges are common in inshore and offshore areas and somewhat less common in riverine areas. Appendix II of this document discusses the numerous types of gear used in estuarine and offshore habitats. This section indicates that mobile bottom-tending gears are commonly used in most inshore and offshore habitats. In the Northeast, otter trawls are used to prosecute most managed fisheries including: Northeast Multispecies; Sea Scallops; Monkfish; Mackerel, squid and butterfish; Summer flounder, scup and black seabass; Bluefish; and Spiny dogfish. Scallop dredges are used in the sea scallop fishery and hydraulic clam dredges are used in the surf clam and ocean quahogs fisheries. Smaller trawls are used in inshore areas and lower estuaries, which are managed by states and not subject to the Magnuson-Stevens Act. In addition, some states allow smaller dredges are used for harvesting oysters, bay scallops, sea urchins, quahogs, and mussels. Hydraulic dredging for softshell clams and bottom trawling for shrimp is also accomplished in certain nearshore and riverine habitats. It is assumed for this analysis that the effects of gear are generally moderate to high in the riverine, inshore and offshore areas, depending upon the type of bottom and the frequency of fishing.

6.6.5 Summary of existing threats to protected resources

Six large whale species (right, humpback, fin, sei, blue and sperm whales) and three sea turtles (leatherback, Kemp's ridley and green turtles) found in the region are listed as "endangered" under the Endangered Species Act. The loggerhead turtle is listed as threatened, and two other species, harbor porpoise and barndoor skates, are candidates for listing. The remaining mammal species are protected under the Marine Mammal Protection Act. The right whale continues to be at the highest risk for extinction because of its low numbers and low reproductive status. Table 123 summarizes the past and current threats for the whale species that have a special status because of threats to their continued sustainability.

Ship strikes and fishing gear entanglement continue to be the most likely sources of injury or mortality for the right, humpback, fin and minke whales. Gear entanglement occurs in the vertical buoy lines of sink gillnet and pot/trap gear, the groundlines of pot/trap gear, and also in the net panels of gillnet gear. Sei, blue and sperm whales are also vulnerable, but fewer ship strikes or entanglements have been recorded. During 1996-2000 in U.S. Atlantic waters, an average of 3.2 whales (right, humpback, fin, sei, sperm, blue and minke, combined) were killed annually by ship strikes, and 7.8 were killed or suffered injuries likely to cause death as a result of gear entanglements (Waring, et al., 2002). Mobile bottom trawls are less of a concern for the large whale species.

Other marine mammals, such as harbor porpoise, dolphins and seals, are also at risk to be entangled in net gear (including seines, gillnets and drift nets). Turtles have been entangled in shrimp trawls, pound nets, bottom trawls and sink gillnets. Shrimp trawls are required to use turtle excluder devices.

Protected species are also affected by habitat alteration or destruction. Species such as turtles may be more prone to such impacts because their nests are particularly vulnerable to disturbance or predation. The impacts of pelagic habitat alteration on protected species are less known. Water quality in coastal areas is particularly vulnerable to coastal pollution from nutrients, which can alter the phytoplankton and the food of species such as the right whale. Toxic contaminants, such as PCBs and DDT which are suspected of causing reproductive failure in many vertebrates including marine mammals (Reijinders and Aguilar, 2002), can also accumulate through the prey species and cause adverse effects to a predator that is higher in the food web. The potential impact of pollution is more likely problematic in nearshore areas closer to the source, such as agricultural and urban runoff and sewer outfalls. Nutrients can also promote toxic phytoplankton blooms, which have been known or suspected in killing whales and other marine mammals (Geraci, et al., 1990; Harwood, 2002).

Low frequency sonar may pose an additional threat, although the extent of its continued use by the U.S. military is unclear at this writing. A successful lawsuit brought by environmental groups limited the use of such sonar following a number of marine mammal deaths in the vicinity of naval exercises in several places around the world. Federal legislation being debated in Congress at this time could override the lawsuit settlement agreement and exempt the military from the "harassment" provisions of the MMPA, easing the restrictions on the limited deployment of low frequency sonar.

The factors discussed above, and other factors, potentially have had cumulative adverse effects on all protected species to varying degrees. Because of a lack of cause-effect data, little is known about the magnitude and scope of these factors and how they have contributed to the species' special listing. The direct and indirect effects of the alternatives in this amendment are discussed in Section 6.0, and summarized in Appendix I. Table 124 summarizes the cumulative effects of the alternatives in the context of the discussion above.

Species	Status	Threats			
		Ship Strikes	Gear Entanglement	Habitat	Other
Right Whale	Endang Highest risk	High Potential	High potential due sink gillnets, pots, traps	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Unknown: Low Genetic diversity; Low reproductive rates; Reduction/ Competition of prey; Harassment
Humpback	Endang	High Potential	High potential	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Unknown: Reduction/ Competition of prey; Harassment
Fin	Endang	High Potential Mortality Less Certain	High potential Mortality Less Certain	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Unknown: Reduction/ Competition of prey; Harassment
Sei	Endang	Potential but few recorded instances	Potential but no recorded instances	Offshore Species Less likely but still vulnerable to Offshore Development	Unknown: Reduction/ Competition of prey; Harassment
Blue	Endang	Potential but few recorded instances	Potential but few recorded instances	Offshore Species Less likely but still vulnerable to Offshore Development	Unknown (no data): Ice entrapment
Sperm	Endang	Potential but few recorded instances	Potential but few recorded instances	Offshore Species Less likely but still vulnerable to Offshore Development	
Minke	Protected under MMPA	Potential but few recorded instances	Sink Gillnets known threat; Pot/Trap Gear	Unknown: Water Quality: Nutrients; Toxic contaminants; Biotoxins; Noise	Aboriginal subsistence whaling on West Greenland stock (non-U.S. stock)

Table 123- Summary of Threats to Protected Species Potentially Affected by Amendment 2 to the Monkfish Plan.

6.6.6 Summary of past, present and future actions affecting the monkfish fishery

6.6.6.1 Past and present actions

The current condition of the monkfish fishery (in the context of the five VECs) is the result of the cumulative effect of the Monkfish FMP, implemented in 1999, and regulations under other FMPs in the region that impact vessels catching monkfish as well as measures adopted under other laws, particularly the Endangered Species Act and the Marine Mammal Protection Act. The status of the fishery, its stocks, human component and the biological and physical environment, is discussed in the Affected Environment section of this document, Section 5.0. .Sections 2.1 - 2.9 contain a discussion of past actions that have cumulatively, and in most cases positively affected the VECs of the monkfish fishery, including regulatory and judicial actions.

In summary, the directed monkfish fishery is relatively young, having emerged over the past three decades and coming under regulation only in 1999 with the adoption of the FMP. The Councils developed the FMP in response to industry and scientific concerns that the increased market demand for monkfish caused landings to increase to unsustainable levels and the stocks were showing symptoms of significant declines (falling survey indices and declining average size of fish in the catch). Since the FMP was implemented in 1999, the northern stock biomass index (3-yr. Average) increased from 0.82 kg/tow to 2.23 kg/tow by the fall, 2002 but declined to 2.03 kg/tow in 2003. The stock is not overfished and is less than 20 percent below Btarget (Btarget=2.50 kg/tow). During the same period, the southern stock index average has risen from 0.47 kg/tow to 0.93 kg/tow, which is the minimum biomass threshold for determining when the stock is overfished (0.93 kg/tow). Since the stock is not below the threshold, the MMC recommended that NMFS declare the stock no longer overfished.

The original FMP called for a three-year effort reduction program and a plan review to set subsequent management targets and measures. The FMP also included default measures for Year 4 that would have eliminated the directed fishery and only allowed monkfish to be landed under incidental catch limits. Framework 1, in 2002, delayed the default measures one year to allow the Councils to complete the review process which included a Stock Assessment Workshop (SAW 34). Based on that review, the Councils implemented Framework 2, which revised the overfishing definition reference points and established an index- and landings-based method for setting annual harvest targets (TAC's) to achieve optimum yield and biomass rebuilding goals, as well as eliminating the default measures.

The two FMP's that have had the greatest impact on monkfish fishery VECs, other than the Monkfish FMP, are the Sea Scallop and Northeast Multispecies FMP's because of the spatial overlap of the fisheries, the relatively high level of incidental catch of monkfish in those fisheries, and the fact that more than 90 percent of the monkfish limited access permit holders are also permitted in one or the other of those two fisheries (evenly split). Both Multispecies and Sea Scallop fisheries have undergone a series of major actions since 1994 to reduce fishing effort and rebuild overfished stocks. These include Multispecies Amendments 5 –13 and 39 framework adjustments (with two pending), and

Sea Scallop Amendments 4-10 and 16 framework adjustments (with one pending). These actions have reduced overall fishing effort significantly since 1994, and have imposed other restrictions such as year-round and seasonal closed areas, and gear restrictions that have affected both the directed and incidental catch monkfish fishery. Cumulatively, these actions have likely had a positive effect on monkfish, contributing to the increasing stock abundance observed over the past five years. Additional action in both FMP's is pending, and will be discussed below (Section 6.6.6.2).

Other FMPs that likely have had an impact on the fishery VECs include those managing other demersal species in the region, such as the Skate FMP (implemented 2003), Spiny Dogfish FMP (implemented 2000), and the Summer Flounder, Scup, Black Sea Bass FMP (1996 and amendments). To varying degrees, these management plans, as well as others in the region, have directly or indirectly affected the monkfish fishery by causing effort to shift among fisheries and by changes to the levels of incidental catch of monkfish. It is not possible within this document to analyze all of the inter-relationships of these management plans with the monkfish fishery because in most cases these relationships are not well understood and vary widely for individual vessels and areas.

In addition to FMPs implemented by the Councils, other actions that have directly and cumulatively affected the monkfish fishery VEC's include three federal court decisions, two marine mammal take reduction plans, and a final rule implemented by NMFS under authority of the Endangered Species Act to protect sea turtles (see Section 2.8). Cumulatively, these actions have limited areas open to fishing on a seasonal basis, specifically to gillnet gear, and have prescribed gear restrictions, including the mandatory use of acoustic deterrent devices in some areas, net limits and buoy line specifications.

Actions and orders by the federal courts have had a cumulative effect on the VECs of the monkfish fishery. In particular, three cases described in Section 2.5.2 have affected the monkfish fishery, *Hall v. Evans, AOC v. Daley, and CLF v. Evans*. In the case of *Hall v. Evans* the court found that the gear-based differential trip limit in the original FMP was violated three of the national standards in the Magnuson-Stevens Act, and ordered that the gillnet limit be increased to the level the trawl limit. As a result, of this action, the Councils had to reduce the trip limits for both gear sectors in order to meet the target TAC when it set the limits in Framework 1. *AOC v. Daley* was the case in which the court determined that the environmental assessments prepared for the EFH provisions of the FMP did not adequately consider a range of alternatives as required under NEPA. As a result of this determination, the Councils have undertaken in this amendment to consider broader range of alternatives that would minimize the impact of the fishery on the EFH of all managed species. Thirdly, the case of *CLF v. Evans* focused on the Multispecies FMP rebuilding plans and resulted in an interim rule significantly reducing fishing effort, and a negotiated settlement under which the NEFMC is developing Multispecies Amendment 13. Since approximately half of the monkfish limited access permit holders also hold multispecies permits, the court's action have already affected fisheries and communities directly (reduced effort and landings) and indirectly (displaced effort). The cumulative effect of these past actions cannot be individually assessed, however, the current state of the fishery is the result of the synergistic effect of all of the actions described above.

6.6.6.2 Reasonably foreseeable future actions

Future actions considered in this section include actions taken under this FMP, actions taken under other FMPs that affect vessels catching monkfish, and actions taken to protect marine mammals or threatened and endangered species. Given that monkfish fishing occurs in relative isolation from other (than fishing) spatially co-occurring activities (for example, shipping and recreational boating), it is unlikely that any regulatory action or other changes in those activities will have an impact on the fishery, or vice versa.

Other activities that could potentially have an impact on monkfish fishing, such as development of offshore energy facilities or offshore aquaculture projects, are not likely to occur in the reasonably foreseeable future (over the next ten years). Although a few offshore aquaculture proposals have been developed in the past, and feasibility studies are currently underway, these projects face a number of technical and environmental obstacles that reduce the likelihood these projects will actually become commercially viable within the next five to seven years.

Included in the reasonably foreseeable future actions that may have an impact on the monkfish fishery are other FMP amendments in various stages of development or implementation, the most notably Multispecies Amendment 13 and Sea Scallop Amendment 10, both of which have been adopted this year, and several follow-up framework adjustments. Both Amendments 13 and 10 will have direct and indirect impacts on monkfish vessels since most monkfish vessels are also permitted in one of those other fisheries and are directly affected by the cumulative effect of the proposed action and those other amendments.

How, and to what magnitude, the effort reductions and area closures or other management measures in Amendments 10 and 13, or subsequent Multispecies or Scallop FMP actions, affect monkfish effort cannot be reliably predicted. On the one hand, if overall effort is reduced, presumably overall monkfish incidental catch levels will also decline (positive). On the other hand, management restrictions in those other fisheries could cause some vessels to redirect their effort toward monkfish (possibly negative, mitigated by the monkfish effort management program implemented by Framework 2). For example, Multispecies Framework 40A (see Section 2.9.2) establishes a pilot program that enables vessels to use their multispecies B Regular DAS to target monkfish while having a minimal impact on groundfish species of concern.

Even vessels not directly impacted by virtue of having a scallop or multispecies permit could be affected by the displacement of effort resulting from restrictions imposed on those fisheries, and by any measures, such as area closures to protect EFH, that restrict the operation of all fishing with specific gear types. The alternatives under consideration to address the conservation and EFH objectives in those other amendments are likely to have a short-term adverse impact on most monkfish vessels that may be somewhat mitigated by actions proposed in this amendment, particularly the establishment of an offshore monkfish fishery program.

Other potential future actions whose effects would be cumulative to the proposed action include actions taken to protect marine mammals, endangered and threatened species. Current measures in effect are discussed in Section 2.8. These could be modified in the future under either a fishery management plan, marine mammal take reduction plan, or regulation promulgated under authority of the Endangered Species Act. Specifically, known or anticipated future actions include: short-term closures to sink gillnets under the Atlantic Large Whale Take Reduction Plan Dynamic Area Management (DAM) system; changes to the Harbor Porpoise Take Reduction Plan; and measures adopted under the NMFS final rule implementing large-mesh gillnet closures off the North Carolina/Virginia coast to protect sea turtles. Since the specific nature of those potential changes are not known at this time, their effect on the monkfish VECs cannot be determined at this time.

Additionally, NOAA Fisheries is currently preparing an Environmental Impact Statement for the ALWTRP to solicit comments on the management measures and provisions in the plan and possible modifications to reduce interactions of right, humpback and fin whales with commercial fisheries. The agency is also preparing to publish a proposed rule for a Bottlenose Dolphin Take Reduction Plan. Both of these actions may affect the operations of the monkfish fishery.

In the more distant future, two other actions outside the fisheries arena could potentially affect the monkfish fishery VEC's due to their geographic overlap: offshore windfarms and offshore oil and gas exploration/drilling. In the case of the windfarm project, the current proposal under consideration would site the facility in Nantucket Sound, which would not likely have a significant effect on the monkfish fishery because it does not overlap. That proposal is controversial, however, and the Army Corps of Engineers is currently preparing an Environmental Impact Statement that may include alternatives that would site the facility further offshore. In that case, there is a potential, but unknown impact on the monkfish fishery, depending on the exact location and other parameters of the project. In the case of offshore oil and gas exploration, a current federal moratorium is preventing any such activities. According the recent media reports, discussions have begun in Washington on reconsidering the moratorium, in which case the potential exists for such activities to have an effect on the monkfish fishery VEC's, since one of the primary areas of interest is Georges Bank. As with the windfarm proposal, however, insufficient detail is available to determine the potential effects of such activities with any reasonable certainty or specificity.

With advances in fishing technology and ongoing restrictions in traditional fisheries, some vessels may begin to develop deepwater fisheries, much like what occurred in Europe over the past two decades. Not much is known at this time about the potential for such fisheries in the northwest Atlantic, nor about how such fisheries would interact, directly or indirectly, with deepwater components of the monkfish fishery or its essential fish habitat. Furthermore, such fisheries would likely have an impact on deepwater coral habitat whose role in the life stages of monkfish and other deepwater species currently being harvested, such as red crab, is not well known. The deepwater fisheries do not have management plans in place at this time, although such plans would likely be implemented if such fisheries were to begin. The cumulative effect of the development of deepwater fisheries and the associated FMP's is not ascertainable at this time.

6.6.7 Cumulative effects of the proposed action

The following table Table 124 summarizes the anticipated cumulative effects of the proposed action on each of the five VECs compared to taking no action. The cumulative effects determination is based on the preceding analysis of non-fishing activites, fishing gear effects, direct and indirect impacts in the context of the past, present and reasonably foreseeable future actions discussed in the preceding section, as well as the analysis of the direct and indirect impacts in Sections 6.2 - 6.5.

In summary, the proposed measures viewed together, are not likely to have a significant cumulative effect on the environment. As a whole, these measures are likely to have a slightly positive effect on communities, since they address a number of issues identified by the affected public, such as regulatory discards and the inability to profitably conduct a traditional offshore fishery. The measures proposed to minimize impacts of the fishery on EFH (SFMA roller restriction and canyon closures) are also positive, but since they are effectively preventative, rather than restrictive on current fishing activities, the impacts are also not significant. The impact of the proposals on the other VECs is essentially neutral compared to no action.

Proposal	Cumulative Effects on Valued Environmental Components (VECs) compared to no action				
	Target Species	Non-target Species	Protected Species	Habitat	Communities
Incidental Catch – 50 lbs./day, 150 max.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – GC scallop and surf clam dredge vessels	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	Slightly positive due to reduced discards and improved profitability.
Incidental Catch – Summer flounder vessels west of 72°30'W	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	No Impact. Incidental catch accounted for in calculation of annual trip limits/DAS for directed fishery. Reduces bycatch of small monkfish. Improved catch data.	Slightly positive due to reduced discards and improved profitability.
Minimum Fish Size	Could negatively impact yield-per-recruit if vessels target smaller monkfish in SFMA. No impact if measure simply converts discards to landings.	No Impact.	No Impact.	No Impact.	Slightly positive due to reduced discards and improved profitability.
Closed Season	No Impact. Spawning area closure (no action) has no apparent biological benefit.	No Impact. Spawning area closure (no action) has no apparent biological benefit.	Could negatively impact protected species, but not clearly or significantly, since varying amounts of gear is still deployed during this period under no action.	No Impact. Short time of closure period under no action is not significantly different, in terms of habitat impacts than proposed elimination of closed season.	Slightly positive due to increased flexibility.

Proposal	Cumulative Effects on Valued Environmental Components (VECs) compared to no action				
	Target Species	**Non-target Species**	**Protected Species**	**Habitat**	**Communities**
Offshore SFMA Fishery Program	Could result in effort shift from inshore to offshore with no overall increase (neutral), but could result in re-activation of monkfish effort (negative), mitigated by DAS pro-rating, gear requirements and other program elements (positive).	Could reduce impact on inshore and multispecies stocks by vessels shifting effort offshore where catch of other species is minimal. Monkfish/multispecies vessels will use multispecies DAS while fishing in the program and, therefore, not have those DAS available to target multispecies).	Would likely have a positive impact, or at least mitigate impacts on protected species since overall effort (DAS) is reduced under proposed action, and vessels must use VMS which will improve information regarding protected species interactions, to the extent they occur offshore.	No impact, or slightly negative. May affect deep water benthic habitats at continental margin as vessels return to traditional areas. Potential exists for some interaction if vessels expand the range of their operations beyond historical areas. EFH Alt. 5AB, roller gear restriction and pro-rated DAS on enrolled vessels may mitigate these effects.	Positive for larger vessels able to fish offshore due to higher profitability, and restores a pre-FMP fishery
Modification of Permit Qualification – South of 38°N	May shift effort from inshore (state waters) to offshore grounds with no overall effort increase. May also result in some effort increase compared to no action if vessels participate who are not currently active in MF fishery (<5 vessels expected). Overall potential effort limited by season/area.	No Impact.	Impact expected to be minimal due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and established sea turtle closures.	Impact expected to be minimal due to small number of affected vessels, seasonal availability of monkfish in the area, area restriction of the proposed action, and established sea turtle closures. Most, if not all affected vessels use gillnets.	Positive for the small number of affected vessels due to increased opportunity and value of vessel permit, and their communities.
Modify the Framework Adjustment Procedure	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.
NAFO Regulated Area Exemption Program	No direct impact on domestic stocks. Could result in increase in effort on NAFO Area stocks, limited greatly by logistical considerations.	No Impact.	No Impact.	No Impact.	Likely positive due to increased flexibility, but cannot be quantified.

Proposal	Cumulative Effects on Valued Environmental Components (VECs) compared to no action				
	Target Species	Non-target Species	Protected Species	Habitat	Communities
EFH – SFMA Roller Gear Restriction	No impact. Vessels targeting monkfish already use this gear, which is intended to prevent expansion of the fishery into complex bottom types, especially offshore canyons.	No direct impact but could be positive on species inhabiting complex habitats, particularly offshore canyons by limiting ability to trawl in those areas.	No Impact.	Positive but not significant – sets maximum roller gear diameter equivalent to size currently in use in the area; prevents expansion of trawl effort into complex bottom areas and canyons.	Slightly negative for vessels not already using this gear, otherwise neutral.
EFH – Canyon Area closures	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	No immediate or direct impact. Vessels targeting monkfish do not fish in these areas currently, but this proposal will prevent expansion into these areas.	Positive but not a significant impact since minimal monkfish fishing occurs in those areas.	No impact likely. Vessels targeting monkfish do not fish in these areas.
Cooperative Research – DAS set aside	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS set aside is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry "buy-in" to science supporting management.
Cooperative Research – DAS exemption	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	No direct impact. DAS exemption is taken from existing allocation. Indirectly could be positive if research results in reduced bycatch, or habitat effects, or improves scientific understanding of monkfish.	Negligible social impact, except that cooperative research has improved science/industry relationship, and fosters industry "buy-in" to science supporting management.
Clarification of Vessel Baseline	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.	No impact. This is an administrative change.	Unknown social impact, or slightly positive since any adjustment is at vessel owner's request only.

Table 124 – Summary of cumulative effects of Amendment 2 proposed action compared to taking no action

6.6.8 Cumulative effects of non-preferred alternatives

The following Table 125 shows the cumulative effects of non-preferred alternatives.

Alternative	Details	Impacts/issues	Cumulative effects
DAS Alternative 1	1. Two alternatives (see Alt. 1a and 1b below) 2. Annual declaration – vessels may elect to fish under Alt. 2 (no action) rules 3. Enrolled vessels may combine DAS usage on trip-by-trip basis 4. When on MF-only DAS, Category C & D vessels would fish as Category A & B 5. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1.	1. Allows for MF specific gear requirements on directed trips – minimize bycatch and EFH impacts 2. Could result in overall increase in fishing effort (vessels could fish MF and Scallop or Multispecies DAS allocations separately) 3. Reduces opportunity cost for vessels targeting monkfish 4. Requires establishment of trawl exempted fishery in NFMA for MF only DAS – or vessels may shift to SFMA to use MF only DAS 5. Economic impact likely to be positive or neutral on affected vessels (Category C & D) 6. **Goal II, Objectives 2 & 3; Goals III & V**	1. Target species: Neutral. TACs/trip limits adjusted annually to achieve rebuilding. Reduced MS and scallop effort (A13 and A10) will likely reduce incidental catch. 2. Non-target species: Positive. Reduced bycatch under large mesh on MF only DAS. 3. Protected species: Neutral or negative, depending on how vessels respond to restrictions in other fisheries, and protection measures adopted outside of the FMP process. 4. Habitat: Positive. Gear requirement on MF only DAS, combined with Amendment 10 and 13 measures will reduce impact on EFH. 5. Communities: Positive. Provides opportunity for vessels facing restrictions in other fisheries.

Alternative	Details	Impacts/Issues	Cumulative Effects
DAS Alternative 1a – Area-based de-coupled DAS (SFMA only) by annual declaration	1. Category C & D vessels annual declaration to have option of MF only DAS in the SFMA 2. Vessel not declaring could fish for monkfish in either area on combined DAS only 3. Vessels declaring may only fish for monkfish in the SFMA, and under incidental limit in NFMA (could not be issued NFMA exemption letter)	1. Vessels declared in may retain the option to fish MF-only or combined DAS in the SFMA 2. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1, SFMA section only 3. Options below for gear requirement on MF only or combined DAS	Unable to discern the difference between the two alternatives, in terms of cumulative effects, except that Alternative 1b provides greater flexibility since it does not restrict the ability to separate DAS to one area. These alternatives are a subset of DAS Alternative 1, discussed above.
DAS Alternative 1b – Annual declaration for de-coupled DAS, not area based	1. Category C & D vessels annual declaration to have option of MF only DAS (not limited by area)	1. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1. 2. Requires establishment of trawl exempted fishery in NFMA for MF only DAS – or vessels may shift to SFMA to use MF only DAS 3. Options below for gear requirement on MF only or combined DAS	

Alternative	Details	Impacts/Issues	Cumulative Effects
DAS Alternative 1 Option 1a – Fleet MF DAS *(MAFMC preferred alternative)*	1. 40 DAS to all limited access permit holders 2. Trip limits/DAS based on current (Framework 2) formula	1. Same allocations as under original FMP 2. Inherent allocation of latent MF effort 3. Option to have variable Fleet DAS and uniform trip limits not practicable	Unable to discern the difference between the two alternatives, in terms of cumulative effects on target species, non-target species, habitat, protected species. Option 1a may have positive cumulative effect on communities where vessel's monkfish activity has been lower during the Option 1b qualification period but may face restrictions in other fisheries in the future. These alternatives are a subset of DAS Alternative 1, discussed above.
DAS Alternative 1 Option 1b – Individual MF DAS	1. Vessels would have individual share of a pool of DAS based on relative proportion of monkfish landings 1997-2001 2. Allocation based on individual share X total DAS pool 3. Total DAS pool based on portion of TAC available to directed fishery divided by average catch per DAS	1. DAS allocations range from 0 (145 vessels) to more than 145 (average on 40 vessels holding 20% of the total pool) 2. Vessels would have 40 DAS pending appeal of individual allocation 3. Effort allocations based on past performance (minimize latent effort) 4. Some vessels that qualify for a limited access permit would not have DAS allocation but could lease DAS (if adopted)	

Alternative	Details	Impacts/Issues	Cumulative Effects
DAS Alternative 1 Option 2a – Implement transferable MF only DAS under Amendment 2 rule	1. Program would take effect upon implementation of Amendment 2 2. DAS transfer program to be based on Multispecies Amendment 13 program with monkfish specific consideration 3. Two options, plus no action, for lease or sale of DAS (see Decision 1d, below)	1. Uncertainty about outcome of Amendment 13 decisions and final program details 2. Would allow for potential activation of latent effort under Fleet DAS (Option 1a above)	Both alternatives are a subset of DAS Alternative 1, discussed above. Both alternatives would allow for transferable DAS, either upon implementation or in the future. Transferable DAS could have a negative cumulative effect on target species, non-target species habitat and protected species if the program results in increased effort, otherwise neutral. Could have a positive cumulative effect on those communities where such programs would promote more efficient use of capital especially where vessels can accumulate DAS and effort is being restricted under other FMP actions. Could have a negative cumulative effect on communities where vessels sell or lease DAS outside of the community and reduce or terminate fishing activity.
DAS Alternative 1 Option 2b – Include transferable DAS in list of possible actions under framework adjustment process	1. Program details and implementation would take place under a future Council action	1. Would allow for development of DAS transfer consistent with program (if) adopted in Multispecies Amendment 13 with monkfish-specific considerations	

Alternative	Details	Impacts/Issues	Cumulative Effects
Transferable DAS Option 1 – No action	1. Transfer of DAS prohibited	1. No impact compared to current program under Fleet DAS 2. Under Individual DAS, if adopted, inactive vessels would have no DAS or reduced DAS allocations and be unable to activate	These alternatives are a subset of DAS Alternative 1, discussed above. The NEFMC has adopted both a leasing and a sale provision in Multispecies Amendment 13. but not in Scallop Amendment 10. Provisions for conservation neutrality and/or capacity reduction through transfer "tax" would be positive for VECs, unless total active effort increases in spite of those protections.
Transferable DAS Option 2 – DAS Leasing	1. Based on alternatives under consideration in Amendment 13, with MF specific considerations 2. Options for conservation equivalency, limitations on number of DAS leased, and program expiration.	1. Could result in activation of latent effort under Fleet DAS 2. Would enable vessels with low individual DAS allocations (if adopted) to increase effort to profitable levels, at a cost, while providing high allocation vessels with flexibility to use or lease DAS 3. Effectiveness of conservation neutrality provisions are uncertain	
Transferable DAS Option 3 – Sale of DAS	1. Based on Multispecies Amendment 13 proposals 2. Options for restricting proportion of transferable DAS and reactivation of sold DAS.	1. Could result in activation of latent effort unless safeguards are developed to maintain conservation neutrality. 2. Amendment 13 formula for defining active/effective effort not directly applicable to monkfish fishery 3. Practicability may depend on outcome of Amendment 13 decision regarding permit splitting.	

Decision 2	Details	Impacts/Issues	Cumulative Effects
Incidental Catch Alternative 1 – No action	1. 50 lbs. tails per trip (possession limit) on small mesh trips	1.	No cumulative effect on non-target species, protected species and habitat. Alternatives 2 and 3 would reduce already insignificant discards on target species and have a proportionally positive effect on communities where fisheries covered under this incidental limit operate due to modestly increased landings allowed.
Incidental Catch Alternative 3 –	1. 50 lbs. tails/day; 500 lbs. maximum	1. Intended to reduce discards 2. Would benefit small mesh trips up to 10 days (freezer boats) 3. Would have minimal impact on total incidental catch of monkfish	

Alternative	Details	Impacts/Issues	Cumulative Effects
GC Scallop/clam dredge Alternative 1 – No action	1. Prohibited from possessing monkfish	1. No evidence these vessels are discarding monkfish	No cumulative effect on non-target species, protected species and habitat. Preferred alternative would reduce already insignificant discards on target species and have a proportionally positive effect on communities where fisheries covered under this incidental limit operate due to modestly increased landings allowed.

Alternative	Details	Impacts/Issues	Cumulative Effects
Incidental catch limit west o f 72°30' Alternative 1 – No action	1. Incidental limit on fluke vessels east of 74° is 50 lbs. possession limit (tail wt.)	1. Multispecies interim rule changed monkfish limit from 5% of total wt. on board as a result of shifting Mid-Atlantic Reg. Mesh Area boundary	No cumulative effect on non-target species, protected species and habitat. Preferred alternative would reduce discards on target species and have a proportionally positive effect on Mid-Atlantic communities where fisheries covered under this incidental limit operate due to landings allowed.

Alternative	Details	Impacts/Issues	Cumulative Effects
Minimum trawl mesh size Alternative 2 –	1. 12" sq. codend; 12' dia. belly and wings 2. Apply on Category A & B, and Scallop C & D vessels on scallop/MF DAS. Option to require on multispecies/MF DAS	1. Reduces bycatch of regulated species and small monkfish, but selectivity characteristics not quantified 2. Increases yield per recruit 3. Regulation to be based on nearest metric equivalent of stock mesh size	1. Target species: Alt. 2 & 3 will result in reduced discards and increased yield per recruit (not quantified) 2. Non-target species: Alt. 2 & 3. will result in reduced bycatch (not quantified). 3. Protected species: Neutral 4. Habitat:: Positive. Lower incidental catch of other species reduces incentive to fish in areas where those species are caught, lowering fishery impact on such habitat. 5. Communities: unknown, but likely positive if yield per recruit is increased and bycatch reduced. Cost of gear upgrading not expected to be significant since nets, codends replaced regularly.
Minimum trawl mesh size Alternative 3 –	1. 12" sq. codend; multispecies mesh in body and wings. 2. Apply on Category A & B, and Scallop C & D vessels on scallop/MF DAS. Option to require on multispecies/MF DAS	1. Reduces bycatch of regulated species and small monkfish, but selectivity characteristics not quantified 2. Increases yield per recruit 3. Regulation to be based on nearest metric equivalent of stock mesh size	

Alternative	Details	Impacts/Issues	Cumulative Effects
Minimum fish size Alternative 1 – No action	1. 11" tail or 17" whole, NFMA 2. 14" tail or 21" whole, SFMA	1. Minimum size cited as primary reason for MF discards in trawl and scallop fishery	Neutral for all VEC's except target species and communities. Moderately negative due to discards.
Minimum fish size Alternative 2, Option 2–	1. Uniform size both areas 2. 10" tail/15" whole	1. Reduces discards of small monkfish in the SFMA 2. Does not eliminate regulatory discards due to minimum size 3. **Goal II; Goal III; Goal IV, Objective 2; Goal VII**	Moderately positive for target species and communities due to reduced discards and improved landings data.
Minimum fish size Alternative 3 –	1. No minimum size	1. Eliminates regulatory discards due to minimum size (not market cull) 2. PDT recommendation 3. Improves data on commercial catch-at-age used in assessments	
Minimum fish size Alternative 4 –	1. Applies only on monkfish-only DAS, if DAS are de-coupled. Councils would select from options above for multispecies/monkfish DAS 2. 14" tail/21" whole in both areas	1. Works in conjunction with increased minimum mesh size on monkfish-only DAS; allows for retention of smaller monkfish caught with groundfish gear on combined multispecies/monkfish DAS 2. Selectivity characteristics of large mesh not quantified; impact on reducing discards uncertain	Cumulative effects fall between those discussed in Alternatives 1 & 2 above

Alternative	Details	Impacts/Issues	Cumulative Effects
Closed Season Alternative 1 – No action	1. Category A & B vessels: 20-day block out of the fishery April – June; Category C & D/Multispecies vessels: 20-day block March-May; Category C & D/Scallop vessels: no requirement 2. Option to include Category C & D/Scallop vessels, if DAS are de-coupled	1. Not effective at shifting effort away from spawning period due to relatively short closure	No cumulative effect expected on the five VECs.
Closed Season Alternative 3 –	1. Increase time out requirement to 40-day block 2. Option to include Category C & D/Scallop vessels, if DAS are de-coupled	1. May provide improved spawning protection, although benefits not certain or well understood for monkfish	Could have a negative cumulative effect on vessels/communities in other fisheries if the additional time out requirement is during periods of high activity or profit. Would have a positive cumulative effect on non-target species that spawn during this period (multispecies) and on protected species if vulnerable to the gear during this period. Cumulative effect on habitat or target species unknown.

Alternative	Details	Impacts/Issues	Cumulative Effects
Offshore SFMA Fishery Alternative 1 – No action	1. All SFMA vessels within gear and permit categories treated equally	1. Offshore fishery not profitable for most vessels due to trip limits and, for some vessels, requirement to use multispecies or scallop DAS	Would continue the negative cumulative effect of the FMP on those vessels/communities that had a dependence on the offshore fishery prior to FMP implementation, and on the target and non-target species to which those vessels re-directed their effort. Neutral or negative on habitat, depending on where those vessels have redirected their effort. Neutral on protected species.

Alternative	Details	Impacts/Issues	Cumulative Effects
Modification of permit qualification for vessels fishing south of 38°N. Landings criteria are the same in all alternatives as current permit requirements. Four alternatives differ on qualification period, **four years prior to date shown below**. If sea turtle closures severely restrict fishing opportunity, area may be expanded to 38°20'N. All other regulations applicable to vessels fishing in the SFMA would apply. Preliminary estimate of number of new permits is given; all would be in Category B & D (lower landings threshold)			
Permit Qualification Alternative 1	1. June 15, 1998, full year landings	1. est. new permits: 7	All alts., including no action, essentially the same with neutral or unknown cumulative effects on all VECs except communities. Alts. 1-4 could have a positive cumulative effect on communities where vessels would qualify for ltd. access permit, but not expected to be significant due to small number of vessels and limited fishery season.
Permit Qualification Alternative 2	1. June 15, 1997, full year landings	1. est. new permits: 3	
Permit Qualification Alternative 4	1. June 15, 1997, landings during March 15 –June 15	1. est. new permits: 3	
Permit Qualification Alternative 5 – no action	1. vessels that have not qualified under original FMP would not be issued limited access permit	1. est. new permits: 0	

Alternative	Details	Impacts/Issues	Cumulative Effect
NAFO Area Exemption Alternative 2 – no action	1. no exemption, must use DAS and comply with trip limits and other FMP regulations.	1.	No cumulative effect expected.

Alternative	Details	Impacts/Issues	Cumulative Effect
EFH Alternative 1 - no action	1. Measures that would be in effect if the Councils took no action on this or other (Multispecies, Scallop) amendments	1. Monkfish trawl fishery has a low impact on monkfish EFH but high impact on vulnerable EFH of some other species	Taking no action would result in continued adverse effects on habitat and other negative impacts of current levels of fishing on target species, non-target species and protected resources. Cumulative effect of no action on communities is unknown.
EFH Alternative 2	1. No specific action on EFH	1. Other actions in Amendment 2 to be analyzed for EFH benefits	The cumulative effect of other actions in Amendment 2 is discussed in other sections of this table under each measure.
EFH Alternative 3	1. Actions taken under Multispecies Amendment 13 and Scallop Amendment 10, in FSEIS incorporated into Alt. 1 since those amendments were implanted after DSEIS publication.	1. Action taken under other FMPs to be analyzed for EFH benefits	Effort reductions and habitat protection measures in these amendments will have a positive cumulative effect on all VECs, except the near-term effect on communities which is expected to be negative.
EFH Alternative 4, Option 2	1. Includes six elements that could be taken together or separately.	1. Designed to minimize ability and incentive to fish in complex bottom. Would also minimize bycatch of regulated species. 2. As a package not tested and not in commercial use. Could be part of trawl experimental fishery adopted under this amendment	Would have a positive cumulative effect on all VECs, except protected resources which is unknown. Would reduce bycatch of target and non-target species, minimize fishery effect on complex habitat, and have a positive effect on communities due to the reduction in discards and the increased opportunity to target monkfish in a clean, directed fishery.
<u>EFH Alternative 5c</u> – Major steep-walled canyons closure	1. Up to twelve identified canyons from Norfolk Canyon to Heezen Canyon (at the Hague Line) 2. Two options: close to trawl gear or all gears, on a MF DAS 3. Closure of waters deeper than 200 m. (~100 fathoms)	1. some overlap with reported monkfish effort, particularly Atlantis, Oceanographer and Hudson Canyons	Would have an unknown or positive cumulative effect on the VECs, particularly habitat and non-target species (coral) due to precautionary action to protect these areas from reasonably foreseeable future development of deepwater fisheries. Avoid future economic cost of managing such fisheries after they become established. Would also have a positive, but indirect effect on essential fish habitat of species that are currently found in adjacent areas.

Alternative	Details	Impacts/Issues	Cumulative Effect
Cooperative Research programs funding. Two alternatives, not including no action, could both be adopted. Four options for DAS set aside/exemptions under consideration: 50, 100, 200, or 500 DAS. Research could be to minimize bycatch, minimize impacts on EFH or other habitat, research to establish exempted fisheries, biology or population dynamics of monkfish, cooperative surveys and gear efficiency, among others.			
Research Alternative 3 – no action	1. Vessels conducting research under EFP or NMFS' RFP may not land monkfish unless they complete an Environmental Assessment to analyze the impacts of a DAS exemption	1.	Research projects *per se* not likely to have a significant cumulative effect. If research results in improvements to management program and scientific understanding, effects would be positive for all VECs, depending on the specific results and follow-on actions.

Alternative	Details	Impacts/Issues	Cumulative Effect
Vessel Upgrading Baseline Alternative 1 – no action	1. Vessel has baseline of vessel when issued its limited access permit; may have two different baselines for permits issued under different FMPs if permit was transferred between issuance	1. Vessels with dual baselines may have to forego a limited access permit in order to upgrade or transfer another limited access permit..	The no action and proposed alternative are neutral with respect to all VECs, except communities. The proposed action would have a positive effect on those communities where vessel upgrading is limited by the more restrictive monkfish permit limitations (no action).

Alternative	Details	Impacts/Issues	Cumulative Effect
NFMA trawl experimental fishery Alternative 2	1. Vessels would operate under a Letter of Authorization from NMFS. 2. Vessels could operate under the DAS set aside or exemption, if adopted under the previous section 3. Three area/seasons identified in the GOM	1. Primary purpose is to determine if a trawl exempted fishery can be established (under the 5% multispecies bycatch rule), and under what gear/area/season restrictions 2. Would also provide opportunity to test the proposed trawl configuration under commercial conditions for reducing bycatch and EFH impacts. 3. **Goal II, Objective 3; Goal III; Goal V, Objectives 1 & 2**	Experimental fishery would be of relatively short duration 1-3 years, therefore, cumulative effect would not likely be significant compared to no action, except , perhaps for the fishing opportunity for vessels facing restrictions in other fisheries (positive on communities). Any action taken as a result of the experimental fisheries, however, could have a positive or negative cumulative effect on one or all of the VECs, depending on the specific actions taken.

Alternative	Details	Impacts/Issues	Cumulative Effect
Change the fishing year. Three alternatives plus no action. Based on alternatives under consideration in Multispecies Amendment 13, but Councils could choose independently from what is adopted in Amendment 13. Would require prorating of DAS during transition period; alternatives provided in next section.			
Fishing Year Alternative 2	1. Jan. – Dec.	1. Aligns fishing year with stock assessment data 2. Not as important in monkfish as in multispecies. 3. Could create staff/administrative workload issues if many plans start simultaneously	These alternatives are administrative in function and would not have a cumulative effect on the VECs.
Fishing Year Alternative 3	1. Oct. – Sept.	1. Fishing year would start at the beginning of the peak monkfish landings and price cycle	
Fishing Year Alternative 4	1. July - June	1. Fishing year would start at the low point in monkfish landings and price cycle	

Alternative	Details	Impacts/Issues	Cumulative Effect
DAS Prorating alternatives. One of the following two alternatives is only necessary if the Councils select a different fishing year under the previous set of alternatives. They do not apply if the Councils take no action on the fishing year question.			
DAS Prorating Alternative 1	1. Transition period is from May 1, 2005 to start of new fishing year. 2. Allocations based on # months in transition period divided by 12, times Amendment 2 DAS allocations	1. Shorter transition period	These alternatives are a subset of the alternatives to modify the fishing year discussed above. They are administrative in function and have no cumulative effect on any of the VECs.
DAS Prorating Alternative 2	1. Transition period is from May 1, 2005 through the next full fishing year 2. Allocations based on # months from May 1, 2005 to new fishing year start date divided by 12 times the Amendment 2 DAS allocations, plus Amendment 2 DAS allocations	1. Longer transition period, may provide greater flexibility for vessels	

Table 125 – Summary of cumulative effects of Amendment 2 non-preferred alternatives

6.7 Impact on Stellwagen Bank National Marine Sanctuary

The Gerry Studds Stellwagen Bank National Marine Sanctuary, established in 1992, is the only such area in the northeast to be so designated under the Marine Protection, Research and Sanctuaries Act (see Figure 87). The designation does not prohibit fishing, although it prohibits mining of sand and gravel and the transfer of petroleum products in the area, and it protects cultural resources (shipwrecks), and requires federal agencies considering any action in the vicinity of the Sanctuary to consult with the Secretary of Commerce.

Monkfish fishing occurs within the Sanctuary boundaries, mostly on trips using gillnets. Based on 2001 data, 5.9 percent of all directed monkfish trips were taken within the Sanctuary boundaries, of which almost 90 percent were gillnet trips (316 trips out of about 360 trips). Monkfish landings on directed trips in the Sanctuary were about 0.6 million pounds, or about three percent of all directed trip landings. (See Figure 88.)

The alternatives under consideration in this amendment are not likely to have a significant effect on the sanctuary, even if DAS are separated, considering that fishing is not an activity regulated by the Sanctuary and already occurs both inside and outside the area. The areas under consideration for a trawl experimental fishery (that could result in establishment of an exempted fishery) are outside of the Sanctuary boundary.

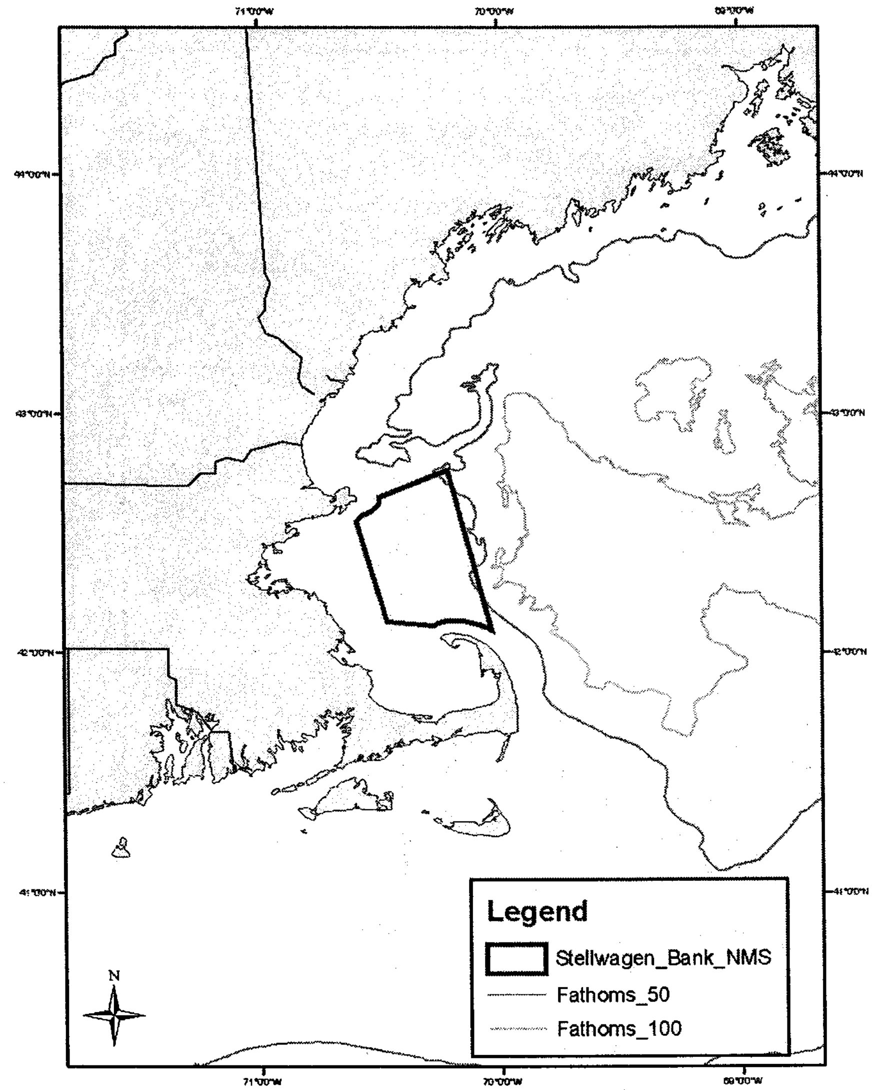

Figure 87 Location of Stellwagen Bank National Marine Sanctuary

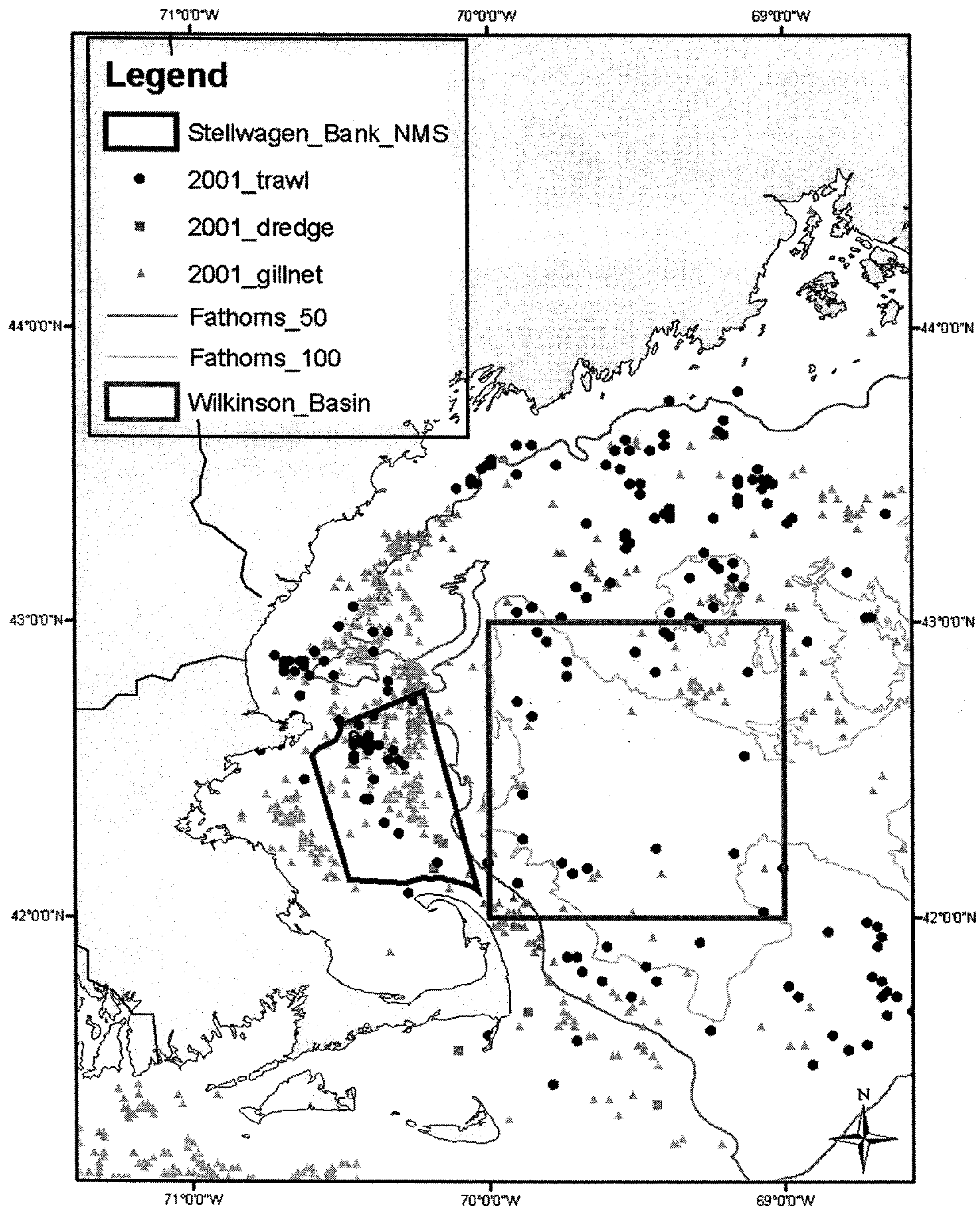

Figure 88 Directed monkfish fishing effort in the vicinity of the Stellwagen Bank National Marine Sanctuary.
Also shown is the proposed Wilkinson Basin experimental fishery area that could be designated a monkfish trawl exempted area pending the results of research.

7.0 MAGNUSON-STEVENS ACT CONSISTENCY

The Magnuson-Stevens Fishery Conservation and Management Act specifies ten National Standards, fourteen required provisions and several discretionary provisions to be contained in each FMP or amendment. The following discussion summarizes how this amendment complies with the Magnuson-Stevens Act.

7.1 National Standards

Section 301 of the Magnuson-Stevens Act requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. The following section summarizes, in the context of the National Standards, the analyses and discussion of the proposed action that appear in various sections of this framework adjustment document.

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The proposed action does not significantly modify the stock-rebuilding program established by the original FMP and modified by Framework Adjustment 2. As noted in Section 2.7, Framework 2 implemented a streamlined procedure for setting optimum yield on an annual basis and for preventing overfishing. While the Councils initially identified a proposal to separate DAS usage requirements on permit Category C and D vessels as their preferred alternative in the DSEIS, in the final recommendation they decided to adopt the no action alternative because of concerns that the proposal would result in increased effort and potentially jeopardize the rebuilding program. The other measures proposed in this amendment do not significantly affect the stock rebuilding program.

(2) Conservation and management measures shall be based upon the best scientific information available.

Several sources of data were used in the development of Amendment 2, including the analysis of impacts. These data sources include, but are not limited to, landings data from vessel trip reports and dealer weighout reports, catch data collected in the NOAA Fisheries Observer Program, effort data collected in the DAS call-in and, where applicable, the electronic vessel monitoring system programs, fisheries independent data collected in the NOAA Fisheries bottom trawl surveys, cooperative research projects, and deep-sea corals and habitat data collected by NOAA-funded National Undersea Research Center. The Councils have determined that these are the best available scientific data, and that the analyses in this document are compliant with the Data Quality Act (see Section 8.7).

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The FMP established a two-area management program for monkfish, covering the exploitable range of the species. SARC 34 discussed the basis for assessing goosefish as a single stock, versus two stocks, and concluded that information was insufficient to make a determination on a biological basis. The SARC noted that the choice of number of management units is independent of the number of assessment units, and that the use of two management units may be required because of the characteristically different fisheries that occur in the two areas, in terms of gear, catch composition, seasonality and other parameters. The Councils considered a single-stock approach, but rejected it for further analysis and consideration prior to the development of the DSEIS (see Section 4.2.1.1).

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The proposed action does not discriminate between residents of different states. While the FMP measures developed to achieve the conservation goals of the FMP may have a differential impact on sectors of the industry, that differential impact is not the purpose. The two-area management program is based on differences in the fisheries between the two areas, and not based on allocation of fishing privileges differently among sectors of the industry. In fact, all limited access permit holders may fish in either management area, subject to the rules that apply in each. In this amendment, the Councils propose to admit qualifying vessels for a limited access permit based on the relatively late development of the monkfish fishery at the southernmost end of the range of the fishery, and to restrict those vessels to the area where those vessels fished during the qualification period.

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The proposed action includes a number of measures that reduce the potential for regulatory discards in fisheries where monkfish is taken incidentally, thereby promoting economic efficiency. The proposal to establish an offshore fishery program also promotes economic efficiency by allowing for higher trip landings, while maintaining an equitable per-vessel opportunity compared to non-participating vessels through an adjustment to the DAS allocations in exchange for the higher trip limits. Overall, while the FMP generally, and the proposed action in particular, may have differential impacts among different fishery groups, economic allocation is not one of the goals and objectives.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

As noted in discussion of National Standards 3 and 4, the two-area management approach, is intended to take into account the differences in fisheries between the two areas. Other measures in the FMP, such as the permit categories and gear- and area-based incidental catch limits are also based on the wide differences among different fisheries that catch monkfish as a target or incidental catch species. The proposed action furthers the Councils' recognition of these differences, particularly the adjustments to the incidental catch limits, the establishement of an offshore fishery program, the modification of permit qualification criteria for vessels at the southernmost extent of the fishery, and the southern area roller gear restriction.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

This amendment contains several measures that minimize costs to vessels, either directly or indirectly, such as measures that reduce discards (adjustments to the incidental catch limit and minimum fish size, and the offshore fishery program). The Councils also propose measures in this amendment that reduce administrative and enforcement costs, such as the uniform minimum fish size and the VMS requirement in the offshore fishery. This FMP does not duplicate measures or regulations implemented under other FMPs, but coordinates with them. For example, this FMP uses DAS controls in the multispecies FMP to regulate effort levels in the northern area fishery, in recognition of the overlap between the two fisheries. This FMP also applies the multispecies minimum mesh size regulations on vessels that have multispecies limited access permits who are fishing on a monkfish DAS.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

The measures proposed in this amendment are not likely to result in significant adverse impacts on affected fishing communities and, in fact, many will have a positive, but not significant impact compared to taking no action. The impact of the proposed action on fishing communities is analyzed and discussed in Section 6.5, and specifically with regards to this national standard in Section 6.5.3. This discussion concludes that "of importance to this particular management plan is the general trend toward neutral or positive outcomes".

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The Councils propose several measures specifically intended to minimize bycatch, including regulatory discards, and a number of measures that will directly or indirectly minimize bycatch although that is not their primary purpose. The measures are listed below:

1. Adjust incidental catch limits for monkfish in other fisheries to minimize the regulatory discarding due to trip limits. (Section 4.1.1)
2. Reduce the minimum fish size for monkfish in the SFMA (Section 4.1.2)
3. Provide incentives (DAS set-aside or exemptions) to vessels to engage in cooperative research, including research on gear, fishing methods or other measures that will reduce bycatch of monkfish or other species. (Section 4.1.9)
4. Close areas of deep-water coral concentrations, Oceanographer and Lydonia Canyons (Section 4.1.8.2)

In addition to the proposed action items listed above, the Councils also considered but did not adopt several other measures that may have also had the effect of minimizing bycatch. Those measures, and the rationale for not being adopted are discussed in Section 4.2.2. They are listed here:

1. Separate monkfish DAS from multispecies and sea scallop DAS, and require large mesh on monkfish-only DAS. This action would reduce bycatch of small monkfish and other species on monkfish DAS due to the larger mesh requirements. (Section 4.2.2.1.1)
2. Reduce or eliminate the minimum fish size for monkfish (Section 4.2.2.4)
3. Implement a trawl experimental fishery in the NFMA for the purpose of establishing an exempted fishery with minimal bycatch of regulated multispecies. (Section 4.2.2.12)
4. Require monkfish trawl vessels to use a net designed to minimize the ability of the vessel to fish in areas where groundfish species are more abundant (that is, rough or complex bottom habitat), to minimize the ability of the net to catch most groundfish species (by reducing the nets ability to "herd" fish, by reducing headrope overhang, and by allowing more escapement through the larger meshes). (Section 4.2.2.9.3), and
5. Increase trawl minimum mesh size on a monkfish DAS (Section 4.2.2.3).
6. Close areas of deep-water coral concentrations, up to 12 canyons along the northeast continental shelf (Section 4.2.2.9.4.1)

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

This amendment does not substantially change the impact of the FMP on safety at sea. The requirement that vessels enrolling in the offshore fishery use electronic vessel monitoring systems, while adopted for enforcement and monitoring purposes, promotes safety by facilitating precise vessel location and two-way communications with vessels.

7.2 Required Provisions

Section 303 of the MSFCMA contains fourteen additional required provisions for FMPs, which are discussed below. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, shall:

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

This amendment modifies provisions of the FMP but does not significantly change the existing stock rebuilding program. As discussed in the previous section, this amendment is consistent with the National Standards.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

The fishery and its components, including biological, social and economic aspects, are described in the Affected Environment section of the EIS. There is no foreign fishing, and there are no known Indian treaty fishing rights.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

Both monkfish stocks are in the middle of a rebuilding program implemented by the original FMP and modified by Framework 2. The status of the stocks, relative to the biomass targets is shown in Figure 11 and Figure 12. Both stocks are no longer overfished, nor rebuilt, but are progressing near (SFMA) or ahead (NFMA) of schedule to be rebuilt by 2009. Stock assessments have been unable to specify maximum sustainable yield, primarily due to a lack of historical catch data. Optimum yield, however, is specified in Framework 2 as the annual catch targets calculated to achieve the annual rebuilding biomass targets (which are based on trawl survey biomass indices). The method for that calculation in described in Section 2.7.

(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

The monkfish fishery is in a rebuilding program that places annual limits on the amount of fish that can be harvested, that is, optimum yield. Even though the fishery is managed under a limited access program, there is sufficient harvesting capacity to take optimum yield, and, in fact, there is sufficient capacity to take additional fish, as evident from the amount of unused DAS allocated. As such, there is no amount of optimum yield available for foreign fishing. Sufficient domestic processing capacity also exists to utilize the monkfish harvested by United States vessels.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

Section 5.3 of this document, Human Environment, contains a description of the fishery and processing sector. The Councils' Monkfish Monitoring Committee compiles and publishes this information annual as part of the Stock Assessment and Fishery Evaluation Report. There is no significant recreational or charter fishery for monkfish.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe

conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

The framework adjustment mechanism established in the FMP provides the Council with the ability to change regulations to address issues such as vessel safety within the context of the fishery management program on an annual, or as needed basis.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

Section 5.0, and particularly Section 5.4, contains the description of monkfish essential fish habitat, and Section 6.3 contains the habitat assessment of the proposed action and alternatives.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

The Council prepares annually a Stock Assessment and Fishery Evaluation (SAFE) Report. Section 5.0 of this document contains the information and data for the 2002 fishing year that is usually provided in the SAFE Report. The 2003 SAFE Report will be incorporated into the documents supporting the annual adjustment for the 2005 fishing year to be submitted by January, 2005.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;

The impacts of the proposed action and alternatives, including cumulative impacts, impacts on the physical and human environments are discussed in Section 6.0 of this document.

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

Framework 2 implemented revisions to the threshold biomass reference point that better align the FMP with NMFS' national standards guidelines. Since both monkfish stocks were overfished at the time the FMP was implemented in 1999, the current management program is designed to rebuild the stocks to target biomass levels by 2009. The program that includes objective and measurable criteria for determining annually the status of the stocks is described in Section 2.7.

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority-- (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;

NMFS currently has in place extensive reporting requirements for all vessels participating in the Federal monkfish fishery, including requirements to report all bycatch. In addition, NMFS increased observer coverage to the 10 percent level for the Northeast (NE) multispecies fishery, which substantially overlaps the monkfish fishery particularly in NFMA, for the 2004 fishing year as mandated by Congress in the budget appropriation for Fiscal Year 2004. NMFS has recently determined that 5 percent observer coverage on all trips fished under a NE multispecies DAS would provide sufficiently robust statistical data to assess and estimate the amount and type of bycatch of regulated species in the NE multispecies fishery. As a result, NMFS intends to maintain observer coverage in the NE multispecies fishery at a minimum level of 5 percent in future years, absent a similar budget appropriation requiring a greater level of observer coverage.

To the extent that vessels have on board a NMFS observer while fishing for monkfish on a multispecies DAS, the increase in observer coverage in the NE multispecies fishery will provide an increase in data on bycatch in the monkfish fishery. Additionally, VMS would be mandatory in the Offshore Fishery Program. Since VMS allows the tracking of predominant fishery locations, coordination of this information with observer coverage may allow for more accurate bycatch assessment and projection. Also, the Study Fleet Pilot Program can provide another source of bycatch information for the different gear types and areas. The Study Fleet Pilot Program is designed to enhance fishery-dependent data necessary for management decisions through the development of electronic reporting technology. The pilot project initially placed NMFS personnel and contracted individuals on board 15 vessels to work with the captain and crew in determining how electronic reporting devices can be integrated in to their fishing operations. Phase Two of the pilot project has been expanded to involve a total of 30 vessels.

On March 6, 2003, NMFS unveiled a national bycatch strategy aimed at further reducing bycatch through fishing gear improvements, standardized reporting, and education and outreach.
One objective of the national bycatch strategy is to develop a national approach that standardizes bycatch reporting. This program will also assess regional progress toward meeting national bycatch objectives and strategies. As part of this national bycatch strategy, each Regional Office of NMFS was tasked with producing regional implementation plans and timelines to implement the national bycatch goal. The Northeast Regional Office (NERO) of NMFS unveiled its regional bycatch plan entitled "Current Bycatch Priorites and Implementation Plan" on November 28, 2003. As part of this plan, NERO in conjunction with the New England and Mid-Atlantic Fishery Management Councils, the Atlantic States Marine Fisheries Commission, and the Northeast and Mid-Atlantic Sea Grant programs, sponsored the Northeast Regional Bycatch Workshop on June 29 – July 1, 2004. The proceedings from this workshop are available from NERO, and online at http://www.nero.noaa.gov/nero/hotnews/index.html.

For the reasons noted above, and given the fact that NMFS is approaching the bycatch issue on a national level versus on a fishery-by-fishery basis, the Councils determined that is not appropriate or practicable to implement a significantly new or expanded reporting methodology focused just on the monkfish fishery through this amendment. Therefore, no additional specific bycatch monitoring alternatives are being recommended in Amendment 2. However, the Councils recommend that further observer coverage aimed specifically at the monkfish fishery be established at a level sufficient to characterize the amount and type of bycatch in this fishery consistent with NMFS' development of bycatch monitoring strategies.

Measures proposed in this amendment to minimize bycatch and/or bycatch mortality are discussed in the previous section under National Standard 9.

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

Monkfish catch in recreational fisheries is not significant enough to be recorded in the recreational catch data.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;

Monkfish catch in recreational fisheries is not significant enough to be recorded in the recreational catch and vessel data. Commercial fishery sectors are described in the Affected Environment section of the EIS accompanying the original FMP and updated in the Affected Environment Section of this SEIS (Section 5.0).

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

As noted under the discussion of National Standard 4 in the previous section, while regulations may have a differential impact on different sectors of the industry, that differential impact is not the purpose, and is done in a manner that is intended achieve the conservation and rebuilding goals of the FMP. The two-area management program is based on differences in the fisheries between the two areas, and not to allocate fishing privileges differently among sectors of the industry.

8.0 CONSISTENCY WITH OTHER APPLICABLE LAW

8.1 National Environmental Policy Act (NEPA)

8.1.1 Introduction

This SEIS addresses the requirements of NEPA to fully consider the impact of proposed actions on the quality of the human environment, consistent with NOAA's policies and guidelines as described in Administrative Order 216-6, as well as subsequent guidance provided at the regional level by NMFS' staff. In addition to the analyses and discussion throughout the rest of this document, this section contains the specific EIS elements not addressed in other sections, such as identification of areas of controversy and issues to be resolved, if any. This document contains some changes from the DSEIS, reflecting the Councils' selection of proposed action and rationale for rejection/selection of particular alternatives. This document also incorporates additional analyses to address public comment on the DSEIS, as well as a complete set of public comments received and the Councils' response (Appendix III).

Based in part on the issues identified during scoping, this EIS includes an evaluation of the effects of fishing on EFH and an analysis of alternatives to minimize to the extent practicable the adverse effects on EFH from fishing. The EIS considers and evaluates alternatives to minimize adverse effects to the extent practicable and include consideration of measures such as closed areas, effort reductions and gear modifications.

The analysis considers the no-action, along with a range of other reasonable alternatives. Information from the original FMP and the EA for Amendment 1 is reflected in this analysis. However, additional information and the selection of alternatives come from a review of the best scientific information available, including new information made available since the fishery management plan amendments were originally completed.

Section 5.0 of the EIS describes the affected biological, physical and human environment. This includes a discussion of the areas and habitat types in the area that EFH is designated. The section's description of the affected environment details the physical and biological resources affected by the alternatives, including a description of the Atlantic Coast shelf ecosystem, benthic habitat, fishery activity and relevant biological resources with an emphasis on benthic organisms.

Section 5.4 includes an evaluation of gear effects on EFH. Specifically, the section describes the gears used, distribution and use of the different gears, the types of gear effects, the vulnerability of the EFH to the gear type and a determination of the adverse effects of gears on EFH.

Section 4.1.8 describes the alternatives for minimizing the adverse effects of fishing on EFH. The section discusses significant issues associated with each alternative including those identified during scoping. The discussion of each alternative for minimizing the effects of fishing on EFH describes the associated fishery management measures. This section concludes with a discussion and explanation of alternatives that were considered but not carried forward for further analysis. The description of alternatives provides a broad summary and comparison of each alternative.

Section 6.0 contains the analysis and discussion of the environmental consequences of the proposed action and alternatives. Specifically, Section 6.3 describes the environmental consequences of each alternative for minimizing the effects of fishing on EFH. For each alternative to minimizing adverse effects of fishing on EFH, the chapter describes the practicability of the associated fishery management measures and evaluates the environmental consequences in relation to effects on EFH, the fishery, other fisheries, and protected resources. The discussion of potential impacts resulting from each alternative is presented in comparative form that clearly distinguishes the environmental consequences of each alternative. The discussion includes a description of the conservation benefits and the adverse impacts of the alternatives.

Appendix II and other parts of this document also include material to satisfy the requirements of the NMFS guidelines at 50 CFR part 600, Subpart J for mandatory requirements of an FMP to:

1. Identify any fishing activities that are not managed under the MSA that may adversely effect EFH.

2. Identify activities other than fishing that may adversely effect EFH. For each activity, the FMP should describe known and potential adverse effects to EFH.

3. Identify actions to encourage the conservation and enhancement of EFH, including recommended options to avoid, minimize, or compensate for the adverse effects, especially in HAPCs.

4. List the major prey species for the species in the fishery management unit and discuss the location of prey species' habitat. Consider adverse effects on prey species and their habitats that may result from actions that reduce their availability, either through direct harm or capture, or through adverse effects to prey species' habitats.

5. Recommendations, in priority order, for research effects necessary to improve upon the description and identification of EFH, the identification of threats to EFH from fishing and other activities and the development of conservation and enhancement measures for EFH.

6. Conduct a cumulative impact analysis that describes impacts on an ecosystem or watershed scale (Cumulative effects of multiple gear types is included in the Gear Effects Evaluation Section)

8.1.2 Scoping

The Councils distributed a scoping document on November 15, 2001 to approximately 400 interested parties and members of the press, and published a Notice of Intent to prepare an SEIS and formally initiate scoping on December 10, 2001 (66 *FR* 63666). In addition to written scoping comments, the Councils received oral comment at a Monkfish Oversight Committee meeting on January 14, 2002, the NEFMC meeting on January 15, and the MAFMC meeting on January 30.

In April 2002, a member of the NEFMC staff visited several ports in the southern range of the fishery to gather information on the fishing communities in the area and take comments from members of the industry there. While not formal scoping hearings, the information collected contributed to the formulation of alternatives and identification of issues considered in this amendment, particularly those pertaining to the revision of the limited entry provisions. Those meetings took place as follows: Point Pleasant, NJ (4/19); Barnegat Light, NJ (4/19); Cape May, NJ (4/21); Wanchese, NC (4/25); Chincoteague, VA (4/26); and Ocean City, MD (4/26).

The Councils held supplemental scoping hearings (67 *FR* 54609, August 23, 2002), specifically to take additional public comment on the proposals to modify the limited entry qualification criteria on September 11 (in Providence, RI and Manteo, NC) and September 12 (in Chincoteague, VA), 2002.

NMFS published a Notice of Intent (NOI) to prepare a supplemental EIS for the EFH components of the Northeast Multispecies and Atlantic Sea Scallop Fishery Management Plans on February 1, 2001 (66 FR 8568). While not specifically addressing the Monkfish FMP, the process is relevant to this amendment given the close connection between multispecies and scallop fishing and monkfish fishing, and the significant overlap of vessels permitted in the three fisheries. The public comment period was open until April 4, 2001. NMFS (and/or the Council) solicited public comment to identify a range of alternatives for identifying and describing EFH and HAPCs and requested information on adverse effects of fishing activities on EFH and HAPCs. NMFS (and/or the Council) solicited public comment on appropriate management measures and alternatives to minimize, to the extent practicable, any adverse effects of fishing on EFH. NMFS (and/or the Council) held 1 public scoping meeting. The meeting occurred in Gloucester, MA on February 22, 2001. No scoping comments were submitted on essential fish habitat issues.

Following the formal scoping period, during the development of Amendment 2, the Councils received a number of comments at Council and Monkfish Committee meetings that were addressed in the DSEIS, even though they had not been raised during the scoping period. Among these was the matter of protecting deep-sea coral habitats which resulting in the inclusion of alternatives proposed and adopted for closing such areas. During the period between scoping and completion of the DSEIS, the Councils implemented Framework 2, to address the rebuilding issues identified during the scoping period that required immediate attention because of the impending default measures in the original FMP that would have unnecessarily shut down the directed monkfish fishery. Also during the period between scoping and completion of the DSEIS, the NEFMC developed and implemented important amendments to the Multispecies (Amendment 13) and Sea Scallop (Amendment 10) FMPs, as well as several framework adjustments to those plans. These actions directly affected vessels fishing for monkfish, and were considered in the selection of final measures proposed in this amendment.

8.1.3 Areas of Controversy

Based on the public comment received on the DSEIS, as presented and summarized in Appendix III, the Councils have concluded that there are no areas of controversy in the proposed action. As reflected in those comments, the alternative that would have separated monkfish DAS usage from multispecies and scallop DAS usage requirements (Decision 1, Appendix I) was the only controversial proposal in the DSEIS, and the Councils did not adopt it, even though it was originally their preferred alternative.

8.1.4 Issues to be Resolved

This section will be completed for the final EIS based on comments received on the DSEIS. Several issues have been identified, however, during the development of this amendment that will be addressed in the future under separate action, and are described below.

8.1.4.1 Measures to minimize fishery interactions with sea turtles

The Councils considered including in this amendment alternative approaches to the sea turtle protection measures implemented by NMFS under the authority of the Endangered Species Act for the large mesh gillnet fishery in the southern end of the range. But, as indicated in Section 4.1.6.2, the development of specific measures, depended on the completion of analysis sea-surface temperature data and other analyses that were not done in time to be included in this amendment. Therefore, no specific measures are proposed for Amendment 2 at this time, but the Councils may take action in the future under the framework adjustment process.

8.1.4.2 Essential Fish Habitat requirements

In addition to the actions being considered in this amendment to minimize the impact of the monkfish fishery on EFH, a number of other Magnuson-Stevens Act requirements (as outlined in NMFS' guidelines) remain to be addressed. In the March 2003, the NEFMC l initiated a Habitat Omnibus Amendment that will be considered as Amendment 3 to the Monkfish FMP, as well as Amendment 14 to the Multispecies FMP, Amendment 11 to the Sea Scallop, Amendment 2 to the Herring FMP, and Amendment 1 to the Skate, Red Crab, and the Atlantic Salmon FMPs. This Omnibus Amendment will be driven by the following Council-approved goals and objectives:

GOALS:

1. Redefine, refine or update the identification and description of all EFH for those species of finfish and mollusks managed by the Council, including the consideration of HAPCs;
2. Identify, review and update the major fishing activities (MSA and non-MSA) that may adversely affect the EFH of those species managed by the Council;
3. Identify, review and update the major non-fishing activities that may adversely affect the EFH of those species managed by the Council;
4. Identify and implement mechanisms to protect, conserve, and enhance the EFH of those species managed by the Council to the extent practicable;
5. Define metrics for achieving the requirements to minimize adverse impacts to the extent practicable;
6. Integrate and optimize measures to minimize the adverse impacts to EFH across all Council managed FMPs;
7. Update research and information needs;
8. Review and update prey species information.

OBJECTIVES:

A. Identify new data sources and assimilate into the process to meet goals (state, federal and other data sources);

B. Implement review of existing HAPCs and consider modified or additional HAPCs ;

C. Review EFH designations and refine or redefine where appropriate as improved data and analysis become available;

D. Develop analytical tools for designation of EFH, minimization of adverse impacts, and monitoring the effectiveness of measures designed to protect habitat;

E. Modify fishing methods and create incentives to reduce the impacts on habitat associated with fishing;

F. Support restoration and rehabilitation of fish habitat which have already been degraded (by fishing and non-fishing activities);

G. Support creation and development of fish habitat where appropriate and when increased fishery resources would benefit society;

H. Develop a strategy for prioritizing habitat protection;

I. Develop criteria for establishing and implementing dedicated habitat research areas;

J. Design a system for monitoring and evaluating the benefits of EFH management actions including dedicated habitat research areas.

8.1.5 LIST OF PREPARERS

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Valerie	Whalen	MAFMC	(formerly)

PDT- Monkfish Plan Development Team
HPDT- Habitat Plan Development Team
NEFMC – New England Fishery Management Council
MAFMC – Mid-Atlantic Fishery Management Council
NERO – NMFS Northeast Regional Office
NEFSC – Northeast Fishery Science Center

8.1.6 SEIS CIRCULATION LIST

The Councils and NOAA Fisheries distributed the DSEIS and "Dear Reviewer" letter to the following agencies for review:

Agency	Address
EPA – Boston Regional Office	Mr. Ira Leighton, Regional Administrator Environmental Protection Agency One Congress Street Boston, MA 02114-2023
EPA – New York Regional Office	Ms. Jeanne M. Fox, Regional Administrator Environmental Protection Agency 290 Broadway, 26th floor New York, NY 10007
EPA – Philadelphia Regional Office	Mr. Stanley Laskowski Director of Environmental Services Division Environmental Protection Agency 1650 Arch Street Philadelphia, PA 19103-2029
EPA – Atlanta Regional Office	Mr. John H. Hankinson, Jr., Regional Administrator Environmental Protection Agency 61 Forsyth Street, SW Atlanta, GA 30303
Marine Mammal Commission	Mr. David Cottingham Executive Director Marine Mammal Commission 4340 East-West Highway, Room 905 Bethesda, Maryland 20814
Atlantic States Marine Fisheries Commission	Mr. John V. O'Shea Executive Director Atlantic States Marine Fisheries Commission 1444 Eye Street, N.W. 6th Floor Washington, D.C. 20005
U.S. Coast Guard – First District Commander	Commander First Coast Guard District (OLE) Coast Guard Building 408 Atlantic Avenue Boston, Massachusetts 02110-3350
U.S. Coast Guard – Fifth District Commander	Commander Fifth Coast Guard District (OLE) Federal Building 431 Crawford Street Portsmouth, Virginia 23704-5004
U.S. Dept. of State	Mr. William Gibbons-Fly Director, Office of Marine Conservation Department of State Washington, D.C. 20520

In addition, copies were distributed on request to interested members of the public, and were available on the NEFMC website.

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8.1.8 Glossary

Adult stage: One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect: Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation: A group of animals or plants occurring together in a particular location or region.

Anadromous species: fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anaerobic sediment: Sediment characterized by the absence of free oxygen.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (A*In*@ meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

Biomass: The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age

* average weight at age) or summarized by groupings (e.g., age 1^+, ages 4+ 5, etc). See also spawning stock biomass, exploitable biomass, and mean biomass.

B_{MSY}: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. For monkfish, $B_{threshold}$ was specified in Framework 2 as $1/2B_{Target}$ (see below).

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy, and was set in the original Monkfish FMP as the median of the 3-yr. running average of the 1965-1981 autumn trawl survey biomass index.

Biota: All the plant and animal life of a particular region.

Bivalve: A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

Bottom tending mobile gear: All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

Bycatch: (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment: Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the time allocated by an FMP to vessels on which the vessel can exceed any incidental catch limit for the species managed by that FMP .

Demersal species: Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Discards: animals returned to sea after being caught; see Bycatch (n.)

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterised by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone, the outer limit of which is 200 nautical miles from the Territorial Sea baseline (usually the shoreline) over which the U.S. government exercises jurisdiction over resources and other maritime activities.

Exempted fisheries: Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Fathom: A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

$F_{0.1}$: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

F_{MAX}: a fishing mortality rate that maximizes yield per recruit. F_{MAX} is less conservative than $F_{0.1}$.

F_{MSY}: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

$F_{threshold}$: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Framework 2 established F_{MSY} as the proxy for $F_{threshold}$. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Fishing effort: the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings: The portion of the catch that is harvested for personal use or sold.

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

Larvae (or Larval) stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the *egg* for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L_{25} is the length where 25% of the fish encountered are retained by the mesh. L_{50} is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Multispecies: the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

Observer: any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

Overfished: A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing: A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding preferably on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. "Recruitment" also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

Sediment: Material deposited by water, wind, or glaciers.

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be "highly" or "moderately" vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock assessment: determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats*.

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Surficial sediment: Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

Surplus production: Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). B_{MSY} is often defined as the biomass that maximizes surplus production rate.

Surplus production models: A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include stock biomass history, biomass weighted fishing mortality rates, MSY, F_{MSY}, B_{MSY}, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB): an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total mortality: The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Trophic guild: Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

Turbidity: Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

Yearclass: also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

Zooplankton: See *Phytoplankton*. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

8.2 Regulatory Impact Review

This section addresses the requirements of Executive Order 12866 and the Regulatory Flexibility Act.

8.2.1 Executive Order 12866

E.O. 12866 requires a review of proposed regulations to determine whether the expected effects would be significant, where a significant action is any regulatory action that may

- Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Of these four criteria, the following discussion focuses only on the expected magnitude of the economic impacts of the proposed action. While a summary of these impacts is provided here, a more detailed discussion appears in Section 6.4.1.

The proposed action would implement a number of changes to the monkfish fishery, some technical in nature and some more administrative. Changes in the incidental catch limit for vessels fishing with small mesh, scallop and clam dredge vessels, and summer flounder vessels fishing west of 72°30' W are proposed, which would reduce the amount of monkfish being discarded while enhancing economic opportunities. A proposed change in the minimum fish size in the southern management area would also work towards this goal. Economic analysis provided in Section 6.4.1 finds that using FY2001 data the maximum revenue gain from the proposed changes to incidental trip limits would be just over $500,000. It is not possible to assess accurately the economic benefit of the change in minimum fish size without detailed information on the size distribution of the commercial catch in both areas.

Elimination of the requirement for limited access vessels to take a 20-day block out of the fishery is proposed, which will provide vessels with greater flexibility in deciding when to fish for monkfish. Another change that may assist vessels in using their available time more wisely is the proposed establishment of an offshore SFMA fishery. Economic opportunities would be restored for some vessels fishing south of 38° 20'N under the proposed modification of permit qualifications for these vessels. It is possible that the addition of these vessels will have an impact on the trip limits for other vessels fishing in the SFMA since the TAC would be distributed over an increased number of vessels, but the economic impact from this change cannot be accurately estimated.

Additions to the list of actions that may be considered under the framework adjustment procedure are also proposed, but these changes are administrative in nature and do not entail economic impacts. Vessels issued a High Seas Fishing Compliance permit and fishing in the NAFO regulatory area would be freed from the regulatory burden of compliance with EEZ regulations under the proposed exemption program. While the economic impact of this change is likely to be positive due to the regulatory relief afforded, the magnitude of the impact cannot be estimated.

Measures to minimize the impact of the monkfish fishery on EFH are also proposed. Trawl roller gear would be limited to a diameter of six inches for vessels fishing on a monkfish DAS in the SFMA, and Oceanographer and Lydonia Canyons would be closed to monkfish vessels. The economic effect of the canyon closures is estimated to be zero since no trips took place in the closure area during 1999 and 2001, while the impact of the change in roller gear diameter is mitigated since most vessels fishing in the SFMA already use this size.

Two alternatives for facilitating cooperative research programs are proposed, a research DAS set-aside and a DAS exemption program. While it is possible that vessels using their full allocation of DAS and not participating in these programs will lose fishing opportunities, the change is distributional in nature since vessels participating in such programs may see an increase in their fishing opportunities, and vessels not using their full allocation will not be affected. Finally, elimination of the dual vessel-upgrading baseline applying to a vessel modified or replaced between the time it received its multispecies or scallop limited entry permit and its monkfish limited entry permit is proposed. The vessel's baseline would be that which applied when the vessel received its original federal permit. This change would not have an immediate economic impact on a vessel's ability to earn fishing income since no proposed measures are tied to the physical dimensions of the vessel.

Overall, the economic effect of the proposed measures will be to increase flexibility in monkfish trip planning and scheduling while providing participants with greater opportunities to retain monkfish. While there may be some short-run costs associated with some of the measures, the protection afforded to EFH and the potential benefits to stock rebuilding can be reasonably expected to contribute to the recovery of the stock. As stock size increases and it becomes possible to ease restrictions on fishing for and the retention of monkfish, both consumers and producers will see economic benefits. Profits for fishing vessels should increase as they are permitted to retain more monkfish while using fewer inputs. This should be at least somewhat offset by reductions in the price received for monkfish as the market supply increases, but the efficiency gains can be expected to lead to greater profitability. As supply increases, the price of monkfish for consumers will also decrease, so they will also benefit. The magnitude of these changes and their distribution between consumers and producers will depend on the slope of the demand and supply curves, but it is reasonable to assume that these changes will be positive from a net national benefit standpoint.

The aggregate economic impact of the proposed measures would not rise to the $100 million threshold for a significant action. As discussed above, using FY2001 data the maximum revenue gain from the proposed changes to incidental trip limits would be just over $500,000. While accurate assessment of economic benefits for changes to the other proposed measures is not possible due to data limitations or the nature of the changes, these changes would be reasonably expected to have only a small economic impact. Therefore, the proposed action is not significant for purposes of E.O. 12866.

8.2.2 Regulatory Flexibility Act

The proposed actions would provide regulatory relief to small fishing vessels participating in the monkfish fishery. In 2001, there were 723 monkfish limited access vessels, 687 of which were participants during FY2001. In addition, there were 1977 incidental catch permits, 1023 of which participated in the fishery. Under the SBA size standards for small fishing entities ($3.5 million), all of the participating vessels are considered small, as gross sales by any entity do not exceed this threshold.

The proposed actions will affect differing numbers of current and potential participating vessels within the fishery. For this reason, the discussion below addresses each proposed action separately, identifying where possible the conditions under which vessels may participate, the potential number of affected entities, and an assessment of the possible economic impacts. Since the economic impacts of the proposed action and non-preferred alternatives are discussed in detail in Section 6.4, this section provides only a summary of these impacts.

8.2.2.1 Incidental catch trip limit

Using FY2001 VTR records, the change to the trip limit for incidental catch would affect 835 trips by 112 vessels, providing these small entities an opportunity to retain more monkfish than under current conditions. Since the proposed change represents an increase over current trip limits, it is impossible to provide a precise estimate of the economic benefit provided by the change, however, an upper bound estimate of the economic benefit can be calculated by assuming that all trips would retain the maximum allowable limit. Using the average 2001 monkfish price of $2.53 per lb., the maximum revenue gain would be $192,000, an average benefit of $1,700 in gross fishing revenue for the 112 vessels that would benefit.

Under the non-preferred alternative that would have increased the maximum amount of monkfish that could be retained by extending the maximum trip duration to 10 days over which the benefits could accrue, the maximum revenue gain for the 112 affected vessels would increase to $322,000, an average benefit of $2,900 per vessel.

8.2.2.2 Incidental catch trip limit – general category scallop dredge and clam dredge vessels

Based on FY2001 VTR data, 1,620 trips by 52 vessels would potentially be affected by the proposed change to the incidental catch limit for general category scallop and clam dredge vessels. Most of these trips were 24 hours or less and nearly all were less than 48 hours. Thus, the maximum benefit from a 50 lb. trip limit would be $204,000, again using the average 2001 monkfish price of $2.53 per pound. This maximum benefit assumes that catch rates on every trip would be at least 50 lbs., which is unlikely since the median landings on incidental landings were only 25 lbs. At this median level, the revenue gain would be approximately $102,000, an average of just under $2,000 per vessel. The proposed incidental trip limit would provide only a modest increase above this level since few general category scallop or clam dredge trips are more than 24 hours, and nearly all are less than 48 hours. Assuming median landings, the maximum benefit would be only $10,250 more than that of the 50 lb. incidental trip limit.

8.2.2.3 Incidental catch trip limit – summer flounder vessels west of 72°30'W

Based on FY2001 VTR records, the proposed change to the incidental catch limit for summer flounder vessels would affect 114 vessels. Using these VTR records, an estimate of the potential revenues that would be restored to these vessels can be calculated. Adjusting the observed monkfish landings by the current incidental catch limit of 50 lbs. per trip, the average annual restored landings per vessel would be 326 lbs., translating to $825 per vessel at the average 2001 monkfish price per pound of $2.53. However, the impact varies greatly across vessels, ranging from no impact for vessels without an observed trip exceeding 50 lbs. to almost $10,000.

8.2.2.4 Minimum fish size

The proposed change to the minimum fish size affects only vessels that fish in the SFMA, since the minimum size will now be uniform between the 2 management areas, at the current size restriction in the NFMA. Thus, for FY2001 the 170 vessels that fished in the SFMA only would face reduced regulatory burden as well as increased economic opportunities The 73 additional vessels that chose to fish in both management areas would also benefit, though only on the trips they take to the SFMA. However, as was noted above, without detailed information on the size distribution of the commercial catch in both areas an accurate assessment of the economic benefit that will accrue to each vessel is not possible.

Other non-preferred alternatives for minimum fish size included a uniform 10-inch minimum tail size, eliminating the minimum size requirement, and an alternative that was contingent on the adoption of a monkfish-only DAS program and would have applied a different minimum size when the vessel was on a monkfish-only DAS. As with the proposed change, it is impossible to estimate with any accuracy the economic benefit of these alternatives without information on the size distribution of the catch. However, the 10-inch minimum tail size option would have increased economic opportunities for all vessels fishing for monkfish, and eliminating the minimum size would have provided for the greatest economic opportunity for vessels participating in the monkfish fishery. The alternative that was contingent on the non-preferred monkfish-only DAS program could possibly have resulted in losses in economic opportunity for vessels fishing in the NFMA on a monkfish-only DAS.

8.2.2.5 Closed season or time out of the fishery

The proposal to remove the 20-day block out of the fishery requirement would result in a reduction in regulatory burden compared to current conditions for the 45 Category A and B monkfish limited access vessels. Currently, category C & D vessels also holding a scallop permit do not face this requirement, and those holding a multispecies permit, are required to take a 20-day block under the Multispecies FMP. However, the extent of the regulatory relief provided by the removal of this requirement is unknown. The 20-day block out of the fishery only means that vessels cannot call in a monkfish DAS. The vessels are still able to fish in other fisheries and retain monkfish up to the bycatch limits for those fisheries. Since the 20-day block may be taken at any time during the prescribed period, vessels can choose the block they expect to be the most advantageous. Nonetheless, as was earlier noted, removal of this requirement does afford the vessels greater flexibility in choosing when to fish for monkfish and when to fish for other species.

The non-preferred alternative would have doubled the current 20-day block to 40 days where vessels could choose to take the entire 40 days consecutively or as two 20-day blocks. This change would have placed a greater burden on trip scheduling and planning since weather can be quite variable during the season. While the economic impacts are unclear, this alternative would have been more burdensome than the no action alternative in a relative sense.

If monkfish DAS had been separated, scallop vessels would also have been required to take time out of the monkfish fishery. This would have represented a change from the flexibility currently available to scallop vessels, but the impact may not have been substantial since scallop vessels would more likely be engaged in a directed scallop fishery than a monkfish fishery due to improvements in the scallop resource. Further, if scallop vessels took advantage of separated monkfish DAS to take a monkfish-only trip, they would be more likely to take such a trip during the fall and early winter months when monkfish prices are peaking. Therefore, there would not likely have been an adverse impact on scallop vessels from the time-out requirement.

8.2.2.6 Offshore SFMA fishery

The proposed offshore SFMA monkfish fishery program would be voluntary and would allow vessels to use their available fishing time more efficiently by effectively increasing the amount of monkfish that could be retained per DAS. Over a fishing season, a vessel participating in the program could potentially achieve higher profitability because more monkfish could be retained using fewer overall inputs. While VMS would be required for participating vessels and vessels currently not having VMS would have to bear the cost of installation, each individual would be able to weight the benefits and costs of participating in the program.

8.2.2.7 Modification of permit qualifications for south of 38°00'N

Economic opportunities would be restored for some vessels fishing south of 38° 00'N under the proposed modification of permit qualifications for these vessels. It is possible that the addition of these vessels will have an impact on the trip limits for other vessels fishing in the SFMA since the TAC would be distributed over an increased number of vessels, but this economic impact from this change cannot be accurately estimated. Preliminary estimates indicate that 5 additional vessels would qualify for a limited access monkfish permit under the proposed action, while the non-preferred alternatives for qualification criteria would have granted permits to either 3 or 7 vessels. From January 1, 1995 to the implementation date of the FMP in November, 1999, these 5 vessels averaged approximately $78,000 in revenues from monkfish, out of total revenues of $480,000 for the period.

8.2.2.8 Modifications to the framework adjustment procedure

The proposed action would modify the framework adjustment process, expanding the list of frameworkable measures to include transferable monkfish DAS, measures to minimize impact on protected species, and requirements to use bycatch reduction devices. While the individual frameworkable measures have associated economic impacts and regulatory burdens, adding these measures to the list of actions that can be taken under the framework adjustment process is administrative in nature and does not affect the current situation faced by any participant in the fishery. The economic impact of each measure will be analyzed in the associated framework action, should the measures be given further consideration by the Councils.

8.2.2.9 NAFO regulated area exemption program

The proposed action would exempt anyone fishing in the NAFO regulatory area from EEZ regulations. Vessels would be assumed compliant with NAFO regulations and would be issued a

High Seas Fishing Compliance permit, relieving participating vessels from dual compliance with both NAFO and EEZ regulations. While this will provide vessels with greater flexibility compared to current regulations, the economic impact of this change cannot be estimated since the extent that current regulations inhibit domestic vessels from participating in the NAFO Regulatory Area is unknown. However, this reduction in regulatory burden would be likely to have a positive economic impact since the EEZ measures are more restrictive that their NAFO counterparts.

8.2.2.10 Measures to minimize fishery impact on EFH

It is impossible to calculate the economic impacts of the proposed actions to minimize the impact of the monkfish fishery on EFH using available data. Restricting the trawl roller gear diameter to a six-inch maximum for vessels fishing on a monkfish DAS in the SFMA may have some short-term negative economic on some vessels, since vessels using non-conforming gear will be required to bear the cost of making the necessary change. However, this roller gear diameter is already used by most vessels in the SFMA, thus reducing the potential impact, although the effect is not quantifiable since the number of non-conforming vessels cannot be determined.

The economic effect of the proposed closure of Oceanographer and Lydonia Canyons to monkfish vessels was estimated by identifying the fishing activity taking place within the areas using the position coordinates provided in VTRs for calendar years 1999 and 2001. No trips were identified as having taken place within the proposed closure area, so based upon this analysis the economic effect of the closure would be zero.

Among the non-preferred alternatives were measures to change the trawl configuration and a proposal to close up to 12 large, steep-walled canyons. The proposed changes to the trawl configuration could have had some short-term negative economic effects depending on the trawl configuration chosen and the management area in which the configuration would have applied. Vessels would have borne the cost of changes to any non-conforming gear, and vessels may not have been able to fish in certain areas. Using 2001 VTR data, closing the 12 canyons would have affected between 3 and 24 trips depending on the option chosen, so this alternative would have been more burdensome than the chosen alternative.

8.2.2.11 Cooperative research programs funding

The economic impacts of the changes to the cooperative research programs funding would be at most redistributive in nature. The 500 DAS set-aside that will be established will be drawn equally from the DAS allocations of all monkfish vessels. Thus, monkfish vessels that use their full allocation of DAS and do not participate in research projects will experience a loss in fishing opportunities, while other vessels could expand their fishing opportunities through participation in such projects. Vessels not using their full allocation of DAS will not be affected.

8.2.2.12 Clarification of vessel baseline history

Clarification of vessel baseline would not have an immediate economic impact on a vessel's ability to earn fishing income in the monkfish fishery, since no proposed measures are tied to the physical dimensions of the vessels. However, the value of the vessel could be affected depending on whether the baseline is higher or lower than the current monkfish baseline, and there may be implications for the pool of trading partners should a DAS leasing program be developed.

8.2.2.13 Other non-preferred alternatives.

Several alternatives that were considered by the Councils but not adopted do not appear in the preceding discussion. There was a proposal to modify the requirement that monkfish vessels also holding a scallop or multispecies limited access permit must use a scallop or multispecies DAS while fishing on a monkfish DAS. Another proposed change was to the minimum trawl mesh size on directed monkfish DAS. A NFMA monkfish trawl experimental fishery was proposed. Finally, there was a proposal to change the fishing year for monkfish. The economic impacts of these non-preferred alternatives are discussed below.

8.2.2.13.1 Monkfish DAS usage by scallop and multispecies limited access permit holders

The economic impact of separating DAS on the 328 Category C and 334 Category D permit holders would have depended on whether they held a multispecies or scallop permit and where they fish or plan to fish. Overall, separation of DAS would not make any vessel worse off than under the no action alternative, since all vessels would have the option to fish under current regulations rather than under separated DAS. The economic impact, therefore, was likely to have been positive or at worst neutral relative to the no action alternative. However, this assumes that the overall effort level within the monkfish fishery would not have changed because of the DAS separation. If vessels that were previously not active in the fishery became so due to separated DAS, the trip limits and DAS allocated to currently active vessels would have to be reduced proportionally to maintain the same overall level of effort. In this case, the economic opportunities of current participants in the fishery could have been reduced.

8.2.2.13.2 Minimum trawl mesh size on directed monkfish DAS

Had any of the mesh alternatives been adopted, vessels would have been required to replace any nonconforming gear to the appropriate configuration. Since the alternatives would have applied only to trawl gear, the economic effects would have been felt only by vessels using large mesh otter trawls.

8.2.2.13.3 NFMA monkfish trawl experimental fishery

If the experimental fishery had been approved, vessels would have been able to retain both their groundfish and monkfish catch while engaged in the experiment. Had the experiment proven successful, an exempted trawl fishery could have been established allowing a larger number of vessels increased fishing opportunities under DAS separation. Since DAS separation was rejected, there would be little economic benefit for trawl vessels to use larger mesh since they would be better off using groundfish gear and fishing with no trip limit in the NFMA.

8.2.2.13.4 Change fishing year

While one of the proposed options would have increased the cost of applying for and administering renewals of permits by putting monkfish at odds with the renewal schedule of every other FMP in the Northeast, this non-preferred alternative would have had limited economic impact.

8.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The Councils have concluded that while most of the measures proposed in this amendment will have no impact on fishery interactions with protected species, some potential negative impacts may result from eliminating the closed season and modifying the permit qualification criteria for vessels fishing in the southernmost range of the fishery. Conversely, the Councils have concluded that the offshore fishery program may have a positive effect on fishery-protected species interactions as a result of the reduced DAS allocations to participating vessels. The Councils expect these impacts, positive or negative, will not be significant and the overall effect of the proposed amendment and the prosecution of the monkfish fishery is not likely to jeopardize any ESA-listed species, or alter or modify any critical habitat, based on the discussion of impacts in this document. The Councils are seeking the concurrence of NMFS in this matter. For further information on the potential impacts of this fishery and the proposed management action on listed species see Sections 5.1.7 and 6.2.3 of this document.

8.4 Marine Mammal Protection Act

The Councils have reviewed the impacts of the Monkfish FMP and this amendment on marine mammals, and have concluded that the management actions proposed are consistent with the provisions of the MMPA are not likely to produce negative impacts beyond the status quo, and will not alter any existing measures to protect the species likely to inhabit the monkfish fishery management unit. For further information on the potential impacts of the fishery, and the proposed management action on marine mammals, see Sections 5.1.7 and 6.2.3 of this document.

8.5 Coastal Zone Management Act

The Council has made an initial determination that the proposed action is consistent to the maximum extent practicable with the approved coastal management programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. This determination is being submitted for review by the responsible state agencies under §307 of the Coastal Zone Management Act concurrent with the submission of the proposed action to NMFS for review and implementation.

8.6 Paperwork Reduction Act

Materials and analysis required under the PRA will be submitted separately and presented in the Amendment 2 proposed rule.

8.7 Data Quality Act

The following sections address the requirements of the Data Quality Act pursuant to the Office of Management and Budget Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by Federal Agencies (67 *Federal Register* 8451, February 22, 2002).

1. Utility of Information Product:

The intended users of the information contained in Amendment 2 are individuals involved in the monkfish fishery, including fishing vessels, fish dealers, fish processors, and other persons interested in the management of the monkfish fishery. The information contained in this FSEIS is beneficial to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures being proposed, and the impacts of those measures. Specifically, the FSEIS provides the intended users with a comprehensive analysis (biological, social, economic, and cumulative) of the impacts of the proposed management measures contained in Amendment 2, and rationale behind the selection of these measures. The FSEIS will also contain a discussion of the impacts of the alternative management measures that were considered in the DSEIS, but were not selected as preferred alternatives by the Councils, including a discussion concerning why these alternatives were not selected. Finally, the proposed rule for Amendment 2 will provide the public with the opportunity to comment on the proposed management measures contained in this FSEIS.

The information contained in the FSEIS includes detailed, and relatively recent information on the monkfish resource, and fishing gear impacts, and therefore represents an improvement over previously available information. For example, Appendix II contains an extensive gear effects evaluation. The document has been revised based on comments received on the DSEIS. Specifically, the document outlines the management measures being proposed by the New England and Mid-Atlantic Fishery Management Councils after taking into account public comments on the proposed alternatives contained in the DSEIS.

The information product will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act, and therefore, may be improved based on any comments received. Furthermore, the NOA for Amendment 2 will provide a 60-day public comment period on the amendment as required by the Magnuson-Stevens Fishery Conservation and Management Act.

The media being used in the dissemination of the information contained in Amendment 2 will be the Federal Register notices for the proposed rule, the (Notice of Availability) NOA for the amendment, and the NOA for the FSEIS. These documents will be made available in printed publication and on the Northeast Regional Office Internet website (www.nero.noaa.gov). In addition, the FSEIS will be made available on CD-rom from the New England Fishery Management Council, and on their website at www.nefmc.org.

2. Integrity of Information Product:
Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Fishery Conservation and Management Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

3. Objectivity of Information Product
For the purpose of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative

Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

National Standard 2 of the Magnuson-Stevens Act states that a FMP's conservation and management measures shall be based upon the best scientific information available. Several sources of data were used in the development of Amendment 2, including the analysis of impacts. These data sources include, but are not limited to, landings data from vessel trip reports and dealer weighout reports, catch data collected in the NOAA Fisheries Observer Program, effort data collected in the DAS call-in and, where applicable, the electronic vessel monitoring system programs, fisheries independent data collected in the NOAA Fisheries bottom trawl surveys, cooperative research projects, and deep-sea corals and habitat data collected by NOAA-funded National Undersea Research Center. The Councils and NOAA Fisheries have determined that these are the best available scientific data.

The proposed management measures contained in Amendment 2 represent the policy choices made, and are supported by the available science. The management measures contained in Amendment 2 are designed to meet the conservation goals and objectives of the FMP, and prevent overfishing and rebuild the monkfish resource while maintaining a sustainable level of monkfish harvest, and to be consistent with the National Standards established in the Magnuson-Stevens Act. The proposed management measures are fully described in Section 4.1of the document in order to distinguish them from associated analyses and underlying science, which is subsequently described in different sections, and consistent with the EIS format prescribed by NEPA.

The data and analyses used to develop and analyze the measures contained in Amendment 2 are included in this FSEIS, and will be summarized in the proposed and final rules for the amendment. Further, the FSEIS includes appropriate references to sections of the document that contain detailed descriptions of source material (i.e. literature cited, appendices), as well as references to tables, figures and analyses.

The information contained in this FSEIS concerning monkfish stock status was peer reviewed according to standard methodology (Stock Assessment Review Committee; SARC). Furthermore, scientists of diverse affiliation (Federal, State, Private, International) were involved in the development of Amendment 2 through the input of various committees and entities (e.g., Plan Development Team, Scientific and Statistical Committee, Northeast Fisheries Science Center, New England Fishery Management Council, Habitat Technical Committee).

With respect to the review of Amendment 2, the review process will involve the New England Fishery Management Council, the Northeast Fisheries Science Center (Center), the Northeast Regional Office, and NOAA Fisheries headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, population biology, economics, and sociology. The Council review process involves public meetings at which affected stakeholders have opportunities to provide comments on the Amendment. Reviews by staff at the Regional Office are conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of Amendment 2 and clearance of the proposed rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.8 Executive Order 12898 – Environmental Justice

Executive Order (E.O.) 12898 requires that, "to the greatest extent practicable and permitted by law… each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions…" The neutral or positive outcomes that have been predicted in this amendment may differentially affect some populations. However, due to data constraints and other concerns the means for conducting this analysis are not yet available. Due to the mobile lifestyle of many vessel crew members and processing plant workers, the U.S. Census does not adequately capture these populations. Nonetheless, many of the participants in the monkfish industry (crew and shoreside support industries) may come from lower income and/or ethnic minority populations who may be vulnerable to more restrictive management measures. This amendment is not expected to disproportionately or adversely effect the health or human environment of minority or low-income populations, given the overall conclusions of no significant environmental effects.

9.0 Index

APPENDIX I
Monkfish FMP Amendment 2

Summary Table of Amendment 2 DSEIS
Alternatives, Impacts and Issues

&

Summary Table of
Advisory Panel and Oversight Committee
Recommendations and Comments

TABLE 1 - Summary of Monkfish Amendment 2 DSEIS Alternatives and Issues/Impacts

NOTE: This table shows the alternatives as presented in the DSEIS. Preferred Alternatives identified in the DSEIS are <u>underlined</u>.

Decision 1	Details	Impacts/Issues
<u>DAS Alternative 1</u> – Category C and D vessels may decouple MF DAS from Scallop or Multispecies DAS usage requirements	1. Two alternatives (see Alt. 1a and 1b below) 2. Annual declaration – vessels may elect to fish under Alt. 2 (no action) rules 3. Enrolled vessels may combine DAS usage on trip-by-trip basis 4. When on MF-only DAS, Category C & D vessels would fish as Category A & B 5. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1.	1. Allows for MF specific gear requirements on directed trips – minimize bycatch and EFH impacts 2. Could result in overall increase in fishing effort (vessels could fish MF and Scallop or Multispecies DAS allocations separately) 3. Reduces opportunity cost for vessels targeting monkfish 4. Requires establishment of trawl exempted fishery in NFMA for MF only DAS – or vessels may shift to SFMA to use MF only DAS 5. Economic impact likely to be positive or neutral on affected vessels (Category C & D) 6. **Goal II, Objectives 2 & 3; Goals III & V**
DAS Alternative 2 – Category C and D vessels on a MF DAS must also use a Scallop or Multispecies DAS	No action	1. MF vessels with multispecies permits fish under gear regulations set by MS FMP

The following decisions 1a-1d pertain only to Alternative 1.

Decision 1a	Details	Impacts/Issues
DAS Alternative 1a – Area-based de-coupled DAS (SFMA only) by annual declaration	1. Category C & D vessels annual declaration to have option of MF only DAS in the SFMA 2. Vessel not declaring could fish for monkfish in either area on combined DAS only 3. Vessels declaring may only fish for monkfish in the SFMA, and under incidental limit in NFMA (could not be issued NFMA exemption letter)	1. Vessels declared in may retain the option to fish MF-only or combined DAS in the SFMA 2. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1, SFMA section only 3. Options below for gear requirement on MF only or combined DAS
<u>DAS Alternative 1b</u> – Annual declaration for de-coupled DAS, not area based	1. Category C & D vessels annual declaration to have option of MF only DAS (not limited by area)	1. Applicable measures under MF only, Multispecies only, or combined DAS summarized in Table 1. 2. Requires establishment of trawl exempted fishery in NFMA for MF only DAS – or vessels may shift to SFMA to use MF only DAS 3. Options below for gear requirement on MF only or combined DAS

Decision 1b	Details	Impacts/Issues
<u>DAS Alternative 1 Option 1a</u> – Fleet MF DAS *(MAFMC preferred alternative)*	1. 40 DAS to all limited access permit holders 2. Trip limits/DAS based on current (Framework 2) formula	1. Same allocations as under original FMP 2. Inherent allocation of latent MF effort 3. Option to have variable Fleet DAS and uniform trip limits not practicable
DAS Alternative 1 Option 1b – Individual MF DAS	1. Vessels would have individual share of a pool of DAS based on relative proportion of monkfish landings 1997-2001 2. Allocation based on individual share X total DAS pool 3. Total DAS pool based on portion of TAC available to directed fishery divided by average catch per DAS	1. DAS allocations range from 0 (145 vessels) to more than 145 (average on 40 vessels holding 20% of the total pool) 2. Vessels would have 40 DAS pending appeal of individual allocation 3. Effort allocations based on past performance (minimize latent effort) 4. Some vessels that qualify for a limited access permit would not have DAS allocation but could lease DAS (if adopted)

Decision 1c	Details	Impacts/Issues
DAS Alternative 1 Option 2a – Implement transferable MF only DAS under Amendment 2 rule	1. Program would take effect upon implementation of Amendment 2 2. DAS transfer program to be based on Multispecies Amendment 13 program with monkfish specific consideration 3. Two options, plus no action, for lease or sale of DAS (see Decision 1d, below)	1. Uncertainty about outcome of Amendment 13 decisions and final program details and impacts 2. Would allow for potential activation of latent effort under Fleet DAS (Option 1a above)
<u>DAS Alternative 1 Option 2b</u> – Include transferable DAS in list of possible actions under framework adjustment process	1. Program details and implementation would take place under a future Council action	1. Would allow for development of DAS transfer consistent with program (if) adopted in Multispecies Amendment 13 with monkfish-specific considerations

Decision 1d	Details	Impacts/Issues
Transferable DAS Option 1 – No action	1. Transfer of DAS prohibited	1. No impact compared to current program under Fleet DAS 2. Under Individual DAS, if adopted, inactive vessels would have no DAS or reduced DAS allocations and be unable to activate
Transferable DAS Option 2 – DAS Leasing	1. Based on alternatives under consideration in Amendment 13, with MF specific considerations 2. Options for conservation equivalency, limitations on number of DAS leased, and program expiration, detailed in Section 4.1.1.1.5.2	1. Could result in activation of latent effort under Fleet DAS 2. Would enable vessels with low individual DAS allocations (if adopted) to increase effort to profitable levels, at a cost, while providing high allocation vessels with flexibility to use or lease DAS 3. Effectiveness of conservation neutrality provisions are uncertain 4. Social and economic impacts would be short-term compared to Option 3
Transferable DAS Option 3 – Sale of DAS	1. Based on Multispecies Amendment 13 proposals 2. Options for restricting proportion of transferable DAS and reactivation of sold DAS.	1. Could result in activation of latent effort unless safeguards are developed to maintain conservation neutrality. 2. Amendment 13 formula for defining active/effective effort not directly applicable to monkfish fishery 3. Practicability may depend on outcome of Amendment 13 decision regarding permit splitting. 4. Would result in permanent redistribution of monkfish effort (positive effect for acquiring vessels and communities, negative for selling vessels and their communities).

Decision 2	Details	Impacts/Issues
Incidental Catch Alternative 1 – No action	1. 50 lbs. tails per trip (possession limit) on small mesh trips	1. No new impacts, but may result in increased discards as stocks rebuild and incidental catch rates increase.
Incidental Catch Alternative 2 –	1. 50 lbs. tails/day; 150 lbs. maximum	1. Intended to reduce discards, especially as stocks rebuild 2. Would benefit small mesh trips up to three days 3. Would have minimal impact on total incidental catch of monkfish 4. Committee's preferred alternative 5. **Goal II; Goal V, Objective 2**
Incidental Catch Alternative 3 –	1. 50 lbs. tails/day; 500 lbs. maximum	1. Intended to reduce discards 2. Would benefit small mesh trips up to 10 days (freezer boats) 3. Would have minimal impact on total incidental catch of monkfish

Decision 3	Details	Impacts/Issues
GC Scallop/clam dredge Alternative 1 – No action	1. Prohibited from possessing monkfish	1. No evidence these vessels are discarding monkfish
GC scallop/clam dredge Alternative 2 –	1. Would include vessels in the incidental catch category under Decision 2 above	1. Would minimize bycatch if monkfish discarding becomes a problem as stocks rebuild 2. **Goal II; Goal IV, Objective 2**

Decision 4	Details	Impacts/Issues
Incidental catch limit west o f 72°30' Alternative 1 – No action	1. Incidental limit on fluke vessels east of 74° is 50 lbs. possession limit (tail wt.)	1. Multispecies interim rule changed monkfish limit from 5% of total wt. on board as a result of shifting Mid-Atlantic Reg. Mesh Area boundary
Incidental catch limit west o f 72°30' Alternative 2 –	1. 5% of total weight of fish on board on large mesh (fluke) trips	1. Would restore limit to pre-interim rule level 2. Committee's preferred alternative 3. **Goal II; Goal IV, Objective 2**

Decision 5	Details	Impacts/Issues
Minimum mesh size Alternative 1 – No action	1. 10" sq./12" dia. codend on trawl Category A & B, and Category C & D Scallop/MF vessels. Category C & D Multispecies/MF vessels use groundfish regulated mesh. 2. 10" mesh on gillnets	1. Rationale for preferred alternative being no action is uncertainty about effectiveness of larger mesh versus efficiency and cost.
Minimum trawl mesh size Alternative 2 –	1. 12" sq. codend; 12' dia. belly and wings 2. Apply on Category A & B, and Scallop C & D vessels on scallop/MF DAS. Option to require on multispecies/MF DAS	1. Reduces bycatch of regulated species and small monkfish, but selectivity characteristics not quantified 2. Increases yield per recruit 3. Regulation to be based on nearest metric equivalent of stock mesh size
Minimum trawl mesh size Alternative 3 –	1. 12" sq. codend; multispecies mesh in body and wings. 2. Apply on Category A & B, and Scallop C & D vessels on scallop/MF DAS. Option to require on multispecies/MF DAS	1. Reduces bycatch of regulated species and small monkfish, but selectivity characteristics not quantified 2. Increases yield per recruit 3. Regulation to be based on nearest metric equivalent of stock mesh size

Decision 6	Details	Impacts/Issues
Minimum fish size Alternative 1 – No action	1. 11” tail or 17” whole, NFMA 2. 14” tail or 21” whole, SFMA	1. Minimum size cited as primary reason for MF discards in trawl and scallop fishery
<u>Minimum fish size Alternative 2</u> –	1. Uniform size both areas 2. Two options: 11” tail/17” whole, or 10’ tail’/15” whole	1. Reduces discards of small monkfish in the SFMA 2. Does not eliminate regulatory discards due to minimum size 3. **Goal II; Goal III; Goal IV, Objective 2; Goal VII**
Minimum fish size Alternative 3 –	1. No minimum size	1. Eliminates regulatory discards due to minimum size (not market cull) 2. PDT recommendation 3. Improves data on commercial catch-at-age used in assessments
Minimum fish size Alternative 4 –	1. Applies only on monkfish-only DAS, if DAS are de-coupled. Councils would select from options above for multispecies/monkfish DAS 2. 14” tail/21” whole in both areas	1. Works in conjunction with increased minimum mesh size on monkfish-only DAS; allows for retention of smaller monkfish caught with groundfish gear on combined multispecies/monkfish DAS 2. Selectivity characteristics of large mesh not quantified; impact on reducing discards uncertain

Decision 7	Details	Impacts/Issues
Closed Season Alternative 1 – No action	1. Category A & B vessels: 20-day block out of the fishery April – June; Category C & D/Multispecies vessels: 20-day block March-May; Category C & D/Scallop vessels: no requirement 2. Option to include Category C & D/Scallop vessels, if DAS are de-coupled	1. Not effective at shifting effort away from spawning period due to relatively short closure
Closed Season Alternative 2 –	1. Eliminate time out requirement	1. Reduces enforcement/administration costs 2. Modest increase in vessel opportunity/flexibility
Closed Season Alternative 3 –	1. Increase time out requirement to 40-day block 2. Option to include Category C & D/Scallop vessels, if DAS are de-coupled	1. May provide improved spawning protection, although benefits not certain or well understood for monkfish

Decision 8	Details	Impacts/Issues
Offshore SFMA Fishery Alternative 1 – No action	1. All SFMA vessels within gear and permit categories treated equally	1. Offshore fishery not profitable for most vessels due to trip limits and, for some vessels, requirement to use multispecies or scallop DAS
Offshore SFMA Fishery Alternative 2 –	1. Annual declaration, Oct. – April season, two area options, trip limits/DAS based on ratio to allocations for other SFMA vessels (2 options), gear and VMS requirements.	1. Could be implemented with or w/o de-coupled DAS 2. Would provide opportunity for vessels to target monkfish offshore, shifting some effort from inshore stocks 3. Vessels would be subject to gear conflict regulations in place, and any EFH measures adopted in this amendment 4. **Goal II, Objectives 2 & 3; Goal III**

Decision 9	Details	Impacts/Issues
Modification of permit qualification for vessels fishing south of 38°N. Landings criteria are the same in all alternatives as current permit requirements. Four alternatives differ on qualification period, **four years prior to date shown below**. If sea turtle closures severely restrict fishing opportunity, area may be expanded to 38°20'N. All other regulations applicable to vessels fishing in the SFMA would apply. Preliminary estimate of number of new permits is given; all would be in Category B & D (lower landings threshold)		
Permit Qualification Alternative 1	1. June 15, 1998, full year landings	1. est. new permits: 7
Permit Qualification Alternative 2	1. June 15, 1997, full year landings	1. est. new permits: 3
Permit Qualification Alternative 3 ***MAFMC preferred alternative***	1. June 15, 1998, landings during March 15 – June 15	1. est. new permits: 5 2. **Goal II, Objective 1;**
Permit Qualification Alternative 4	1. June 15, 1997, landings during March 15 – June 15	1. est. new permits: 3
Permit Qualification Alternative 5 – no action	1. vessels that have not qualified under original FMP provisions would not be issued limited access permit	1. est. new permits: 0

Decision 10	Details	Impacts/Issues
NAFO Area Exemption Alternative 1	1. Letter of Authorization 2. Allows vessels to transit EEZ and land monkfish caught outside EEZ 3. Subject to NAFO regulations, including VMS 4. No federal monkfish permit required	1. Consistent with Multispecies FMP exemption 2. Provides economic opportunity for vessels 3. Goal II, Objective 4
NAFO Area Exemption Alternative 2 – no action	1. no exemption, must use DAS and comply with trip limits and other FMP regulations.	1. No negative impacts but would retain inconsistency with Multispecies FMP

Decision 11	Details	Impacts/Issues
Essential Fish Habitat Alternatives. Except for no action, alternatives are not exclusive, that is, Councils may select more than one preferred alternative.		
EFH Alternative 1 - no action	1. Measures that would be in effect if the Councils took no action on this or other (Multispecies, Scallop) amendments	1. Monkfish fishery has a low impact on monkfish EFH but high impact on EFH of other species
EFH Alternative 2	1. No specific action on EFH	1. Other actions in Amendment 2 to be analyzed for EFH benefits
EFH Alternative 3	1. Actions taken under Multispecies Amendment 13 and Scallop Amendment 10	1. Action taken under other FMPs to be analyzed for EFH benefits
EFH Alternative 4	1. Two trawl gear configuration options, plus no action 2. Option 2 includes six elements that could be taken together or separately. See Section 4.1.9.4.2 3. Option 3 could be considered if Option 2 not adopted and DAS are not de-coupled. Would set maximum disc diameter at 6 inches in the SFMA	1. Option 2 designed to minimize ability and incentive to fish in complex bottom. Would also minimize bycatch of regulated species. 2. Option 2 as a package not tested and not in commercial use. Could be part of trawl experimental fishery adopted under this amendment 3. Option 3 already used by most vessels in the SFMA
EFH Alternative 5ab – Oceanographer Canyon and Lydonia Canyon closure	1. Does not close waters shallower than 200 meters. 2. Two options: close to trawl gear or all gears, on a MF DAS	1. While corals are not part of EFH, impacts to deepwater corals could have an indirect adverse impact on EFH. 2. Data from 2001 show no overlap with directed MF fishery
EFH Alternative 5c – Major steep-walled canyons closure	1. Up to twelve identified canyons from Norfolk Canyon to Heezen Canyon (at the Hague Line) 2. Two options: close to trawl gear or all gears, on a MF DAS 3. Closure of waters deeper than 200 m. (~100 fathoms)	1. some overlap with reported monkfish effort, particularly Atlantis, Oceanographer and Hudson Canyons

Decision 12	Details	Impacts/Issues
Cooperative Research programs funding. Two alternatives, not including no action, could both be adopted. Four options for DAS set aside/exemptions under consideration: 50, 100, 200, or 500 DAS. Research could be to minimize bycatch, minimize impacts on EFH or other habitat, research to establish exempted fisheries, biology or population dynamics of monkfish, cooperative surveys and gear efficiency, among others.		
Research Alternative 1 – DAS set aside	1. Vessel allocations would be reduced by equal contribution to pool for research/surveys 2. NMFS would award DAS to vessels conducting research/surveys based on proposals' requests.	1. Would streamline research program review and provide cost-reductions through allowing monkfish landings 2. Vessel contributions to be less than 1 DAS for the largest proposed pool of DAS (500) 3. **Goal III; Goal V, Objectives 1 & 2; Goal VI**
Research Alternative 2 - DAS Exemption	1. Vessel allocations would not be reduced 2. NMFS would issue exemption upon approval of Experimental Fishery Permit application	1. see item 1 above 2. Committee preferred alternative
Research Alternative 3 – no action	1. Vessels conducting research under EFP or NMFS' RFP may not land monkfish unless they complete an Environmental Assessment to analyze the impacts of a DAS exemption	1. Reduced incentive for cooperative research

Decision 13	Details	Impacts/Issues
Vessel Upgrading Baseline Alternative 1 – no action	1. Vessel has baseline of vessel when issued its limited access permit; may have two different baselines for permits issued under different FMPs if permit was transferred between issuance	1. Vessels with dual baselines may have to forego a limited access permit in order to upgrade or transfer another limited access permit..
Vessel Upgrading Baseline Alternative 2	1. Baseline would be set at characteristics of permit when vessel was issued its first federal limited access permit.	1. Applies a single vessel upgrading baseline to each vessel 2. **Goal II; Goal VII**

Decision 14	Details	Impacts/Issues
NFMA trawl experimental fishery Alternative 1 – no action	1. Trawl experimental fishery, for purposes of establishing a monkfish exempted fishery in the NFMA would require researchers to complete EFP application and possibly an EA to conduct the research. If proposed by NMFS, vessels would have to undergo an RFP or grants administrative process	1. Vessels with dual baselines may have to forego a limited access permit in order to upgrade or transfer another limited access permit..
NFMA trawl experimental fishery Alternative 2	1. Vessels would operate under a Letter of Authorization from NMFS. 2. Vessels could operate under the DAS set aside or exemption, if adopted under the previous section 3. Three area/seasons identified in the GOM	1. Primary purpose is to determine if a trawl exempted fishery can be established (under the 5% multispecies bycatch rule), and under what gear/area/season restrictions 2. Would also provide opportunity to test the proposed trawl configuration under commercial conditions for reducing bycatch and EFH impacts. 3. **Goal II, Objective 3; Goal III; Goal V, Objectives 1 & 2**

Decision 15	Details	Impacts/Issues
Change the fishing year. Three alternatives plus no action. Based on alternatives under consideration in Multispecies Amendment 13, but Councils could choose independently from what is adopted in Amendment 13. Would require prorating of DAS during transition period; alternatives provided in next section.		
Fishing Year Alternative 1 – no action	1. May - April	1. Same as Multispecies. 2. Results in shortest gap between fall survey (used to set TAC and trip limits) and start of fishing year while allowing for proposed rule 3. Rationale for preferred alternative is item 2 above and issues identified below with other alternatives.
Fishing Year Alternative 2	1. Jan. – Dec.	1. Aligns fishing year with stock assessment data 2. Not as important in monkfish as in multispecies. 3. Could create staff/administrative workload issues if many plans start simultaneously
Fishing Year Alternative 3	1. Oct. – Sept.	1. Fishing year would start at the beginning of the peak monkfish landings and price cycle
Fishing Year Alternative 4	1. July - June	1. Fishing year would start at the low point in monkfish landings and price cycle

Decision 16 – no preferred alternative	Details	Impacts/Issues
DAS Prorating alternatives. One of the following two alternatives is only necessary if the Councils select a different fishing year under the previous set of alternatives. They do not apply if the Councils take no action on the fishing year question.		
DAS Prorating Alternative 1	1. Transition period is from May 1, 2005 to start of new fishing year. 2. Allocations based on # months in transition period divided by 12, times Amendment 2 DAS allocations	1. Shorter transition period
DAS Prorating Alternative 2	1. Transition period is from May 1, 2005 through the next full fishing year 2. Allocations based on # months from May 1, 2005 to new fishing year start date divided by 12 times the Amendment 2 DAS allocations, plus Amendment 2 DAS allocations	1. Longer transition period, may provide greater flexibility for vessels

Decision 17	Details	Impacts/Issues
Modify Framework Adjustment procedure – Alternative 1 - No action	Take no action on both of the following two proposals.	1. Taking no action would require the Councils to adopt either of the following (protected species measures or bycatch reduction devices only through the amendment process).
Include measures to minimize impact on protected species Alternative 2	1. Would enable Councils to adopt through the framework adjustment process gear-specific time/area closures and/or gear modification rules to minimize protected species interactions	1. Minimize the time and administrative burden required to implement these rules.
Include bycatch reduction devices Alternative 2	1. Would enable Councils to adopt through the framework adjustment process gear requirements to minimize bycatch	1. Minimize the time and administrative burden required to implement these rules.

TABLE 2 - Summary of Monkfish Amendment 2 Advisory Panel and Oversight Committee Recommendations and Comments and Councils' Recommendations for Final Measures

NOTES: ***Preferred Alternatives in the DSEIS are underlined while Alternatives recommended by the Councils are identified under "Recommendations".***

Decision 1	Recommendations	Comment
DAS Alternative 1 – Category C and D vessels may decouple MF DAS from Scallop or Multispecies DAS usage requirements		One advisor supported to restore offshore fishery, to be done incrementally. One OS member supported as a means to measure and control NFMA monkfish effort.
DAS Alternative 2 – Category C and D vessels on a MF DAS must also use a Scallop or Multispecies DAS	**AP and OS** **Councils**	Both concerned about effort increases, on monkfish and multispecies, and impact of resulting adjustments to trip limits and DAS on currently active vessels. OS also cited impact on skate rebuilding, and lag time in adjustment to effort increases (NMFS comment).

NOTE: The following decisions 1a-1d pertained only to Alternative 1 above. The AP recommended alternatives in the event the Councils decide to adopt Alternative 1 anyway. The OS only made a recommendation on Decision 1c.

Decision 1a	Recommendations	Comment
DAS Alternative 1a – Area-based de-coupled DAS (SFMA only) by annual declaration		
DAS Alternative 1b – Annual declaration for de-coupled DAS, not area based	**AP**	If Councils consider de-coupling in the future, they should consider NFMA only.

Decision 1b	Recommendations	Comment
DAS Alternative 1 Option 1a – Fleet MF DAS *(MAFMC preferred alternative)*	**AP**	
DAS Alternative 1 Option 1b – Individual MF DAS		

Decision 1c	Recommendations	Comment
DAS Alternative 1 Option 2a – Implement transferable MF only DAS under Amendment 2 rule		
DAS Alternative 1 Option 2b – Include transferable DAS in list of possible actions under framework adjustment process	**AP and OS** **Councils**	Whether or not Councils adopt Alternative 1, Decision 1.

Decision 1d	Recommendations	Comment
Transferable DAS Option 1 – No action		
Transferable DAS Option 2 – DAS Leasing	**AP**	
Transferable DAS Option 3 – Sale of DAS	**AP**	

Decision 2	Recommendations	Comment
Incidental Catch Alternative 1 – No action – 50 lbs.	**AP (majority)**	Enforcement concerns with per-day limit not on DAS call-in or VMS.
Incidental Catch Alternative 2 – 50 lbs./day - 150 lbs. max.	**OS and one AP member** **Councils**	Reduces regulatory discards in multi-day trips for fluke, whiting and squid. Electronic reporting partially addresses enforcement concerns.
Incidental Catch Alternative 3 – 50 lbs./day - 500 lbs. max.		

Decision 3	Recommendations	Comment
GC Scallop/clam dredge Alternative 1 – No action		
GC scallop/clam dredge Alternative 2 – Include in Decision 2 incidental limit	**AP and OS** **Councils**	AP recommends 50 lbs. possession limit, regardless of Decision 2 alternative chosen. Considered and rejected by OS.

Decision 4	Recommendations	Comment
Incidental catch limit west of 72°30' Alternative 1 – No action		
Incidental catch limit west of 72°30' Alternative 2 – Restore incidental limit on Mid-Atlantic large mesh vessels to 5% of total weight of fish on board. *See comment on recommended 450 lb. cap.*	**AP and OS** **Councils**	Both recommend a cap of 450 lbs. (tail wt.) NEMFC adopted 450 lb. cap. Rationale: cap would keep incidental catch below directed fishery trip limit while still minimizing regulatory discards in fluke fishery; fluke vessels now targeting scup have larger total catch than in the past, therefore 5% allowance represents more total monkfish allowance (in excess of the directed fishery)

Decision 5	Recommendations	Comment
<u>Minimum mesh size Alternative 1</u> – No action	**One AP member** **<u>Councils</u>**	NEFMC cited lack of selectivity data for 12-inch trawl gear; minimal bycatch of groundfish and sub-legal sized monkfish with 10" square mesh.
Minimum trawl mesh size Alternative 2 – 12" throughout trawl net	**One AP member**	
Minimum trawl mesh size Alternative 3 – 12" sq. codend	**AP (majority) and OS** **OS recommends 30 cm. sq. mesh for 20 meshes or 40 bars**	Reduces regulatory discards, minimal cost.

Decision 6	Recommendations	Comment
Minimum fish size Alternative 1 – No action	**AP divided (Alt. 1 and 2)**	AP supporters did not want smaller fish size in SFMA.
<u>Minimum fish size Alternative 2</u> – Uniform fish size in both areas; Options for 11" and 10" tail.	**AP divided (Alt. 1 and 2) with support for 11" tail** **OS with 11" tail** **<u>Councils</u> w/ 11" tail**	
Minimum fish size Alternative 3 – no min. fish size		
Minimum fish size Alternative 4 – Uniform, 14" tail in both areas on MF only DAS, one of above options for MS/MF DAS. Only applies if DAS are decoupled in Decision 1.		

Decision 7	Recommendations	Comment
Closed Season Alternative 1 – No action (20 days out)		
Closed Season Alternative 2 – Eliminate closed season	**AP and OS** **<u>Councils</u>**	Ineffective at protecting spawning fish. Reduces FMP complexity.
Closed Season Alternative 3 – 40 day closed season		

Decision 8	Recommendations	Comment
Offshore SFMA Fishery Alternative 1 – No action		
<u>Offshore SFMA Fishery Alternative 2</u> – includes two area options and two trip limit/DAS options (Option 1 has variable trip limit/DAS ratios; Option 2 has fixed trip limit of 1,600 lbs./DAS with variable DAS ratio)	**AP and OS with Area Option 1 (squid exemption line) and Trip Limit/DAS Option 2.** **<u>Councils</u>**	

Decision 9	Recommendations	Comment
Permit Qualification Alternative 1 – four years prior to 6/15/98		
Permit Qualification Alternative 2 – four years prior to 6/15/97		
Permit Qualification Alternative 3 *MAFMC preferred alternative* – four years prior to 6/15/98 (3/15 – 6/15 only)	**AP and OS** **Councils**	
Permit Qualification Alternative 4 - four years prior to 6/15/97 (3/15 – 6/15 only)		
Permit Qualification Alternative 5 – no action		

Decision 10	Recommendations	Comment
NAFO Area Exemption Alternative 1 – allow exemption	**AP and OS** **Councils**	
NAFO Area Exemption Alternative 2 – no action		

Decision 11	Recommendations	Comment
Essential Fish Habitat Alternatives. Except for no action, alternatives are not exclusive, that is, Councils may select more than one preferred alternative.		
EFH Alternative 1 - no action		
EFH Alternative 2 - Consider other Amendment 2 actions	**OS, Councils**	
EFH Alternative 3 – Consider MS Amendment 13 and Scallop Amendment 10 actions	**OS, Councils**	
EFH Alternative 4 – Trawl gear modification options. Option 1: no action; Option 2 specified trawl net design; Option 3 max. disc diameter in SFMA, only to be considered if Option 2 not adopted and DAS not decoupled under Decision 1.	**AP and OS recommend Option 3.** **Councils (Option 3)**	AP recommends only mesh-size component of Option 2 be adopted until other elements have been tested, and then adopted through a framework adjustment. Enforcement concerns with complex gear regulations.
EFH Alternative 5ab – Oceanographer Canyon and Lydonia Canyon closure	**OS with Option 2 (all gears on a monkfish DAS)** **Councils**	AP strongly supports protection of deep-sea corals from all gears having an impact, not just monkfish gear. Should be addressed in the Habitat Omnibus Amendment.
EFH Alternative 5c – Major steep-walled canyons closure		See comment above (5AB).

Decision 12	Recommendations	Comment
Cooperative Research programs funding. Two alternatives, not including no action, could both be adopted. Research could be to minimize bycatch, minimize impacts on EFH or other habitat, research to establish exempted fisheries, biology or population dynamics of monkfish, cooperative surveys and gear efficiency, among others.		
Research Alternative 1 – DAS set aside	**AP and OS OS recommends up to 500 DAS available to both programs, combined. Councils**	
Research Alternative 2 - DAS Exemption	**AP and OS OS recommends up to 500 DAS available to both programs, combined. Councils**	
Research Alternative 3 – no action		

Decision 13	Recommendations	Comment
Vessel Upgrading Baseline Alternative 1 – no action		
Vessel Upgrading Baseline Alternative 2 – set baseline at first federal permit level	**AP and OS, with stipulation that adjustment be a one-time opportunity, and only at vessel owner request Councils**	NEFMC also adopted OS and AP stipulation.

Decision 14	Recommendations	Comment
NFMA trawl experimental fishery Alternative 1 – no action		
NFMA trawl experimental fishery Alternative 2 – establish GOM experimental fishery for two years	**AP**	OS motion failed 3-4. Action viewed as unnecessary since vessel can, and are already doing the same experimental work

Decision 15	Recommendations	Comment
Change the fishing year. Three alternatives plus no action. Based on alternatives under consideration in Multispecies Amendment 13, but Councils could choose independently from what is adopted in Amendment 13. Would require prorating of DAS during transition period; alternatives provided in next section.		
Fishing Year Alternative 1 – no action	**AP and OS, Councils**	
Fishing Year Alternative 2 – calendar year		
Fishing Year Alternative 3 – Oct. – Sept.		
Fishing Year Alternative 4 – July - June		

Decision 16 – no preferred alternative	Recommendations	Comment
DAS Prorating alternatives. One of the following two alternatives is only necessary if the Councils select a different fishing year under the previous set of alternatives. They do not apply if the Councils take no action on the fishing year question.		
DAS Prorating Alternative 1 – partial year		
DAS Prorating Alternative 2 – full year plus partial year		

Decision 17	Recommendations	Comment
Modify Framework Adjustment procedure – Alternative 1 - No action		
Include measures to minimize impact on protected species - Alternative 2	**AP and OS** **Councils**	
Include bycatch reduction devices Alternative 2	**AP and OS** **Councils**	

APPENDIX II

Monkfish FMP Amendment 2
Habitat Considerations – Gear Effects Evaluation

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1.0 Essential Fish Habitat Gear Effect Evaluation

1.1 Overview

Pursuant to the EFH regulations (50 CFR 610.815(a)(2)), FMPs must include an evaluation of the potential adverse effects of fishing on EFH, including effects of each fishing activity regulated under federal FMPs. The evaluation should consider the effects of each fishing activity on each type of habitat found within EFH. FMPs must describe each fishing activity, review and discuss all available and relevant information (such as information regarding the intensity, extent, and frequency of any adverse effect on EFH; the type of habitat within EFH that may be affected adversely; and the habitat functions that may be disturbed), and provide conclusions as to whether and how each fishing activity adversely affects EFH. The evaluation should also consider the cumulative effects of multiple fishing activities on EFH. In completing this evaluation, Councils should use the best scientific information available, as well as other appropriate information sources. Councils should consider different types of information according to their scientific rigor.

Magnuson-Stevens Act / EFH Provisions detailed in the Final Rule mandates that each FMP must:

- Contain an evaluation of the potential adverse effects of fishing on EFH designated under the FMP, including effects of each fishing activity regulated under the FMP or other Federal FMPs.
- Consider the effects of each fishing activity on each type of habitat found within EFH.
- Describe each fishing activity, review and discuss all available relevant information, and provide conclusions regarding whether and how each fishing activity adversely affects EFH.

This section, considered the Gear Effects Evaluation for the Draft Environmental Impact Statement for the Essential Fish Habitat Components of Amendment 2 satisfies these requirements. The SFA requires the NEFMC to minimize, to the extent practicable, the adverse impacts of fishing on the EFH associated with any federally regulated fishing activities in the Northeast region. To do this, this amendment must evaluate the effects of all fishing gears used in the region on monkfish EFH, following the guidelines indicated above. NEPA requires that each management alternative, either for improving yield or minimizing effects of fishing on monkfish EFH, must be analyzed to evaluate the environmental consequences on other fishery resources and their habitats and benthic communities.

Since the implementation of the Council's Omnibus EFH Amendment of 1998 (NEFMC 1998), NMFS, NEFMC and MAFMC conducted a Gear Effects Workshop that evaluated the effects of fishing gears used in the Northeast region on mud, sand, and gravel habitats (NEREFHSC 2002). Additional sources of information include work done by the NEFMC Habitat Technical Team, and a National Research Council report on the Effects of Trawling and Dredging on Seafloor Habitat (NRC 2002). Additional information is included in this document.

1.2 Gear Descriptions

Updated gear descriptions are included for the following general gear categories: bottom tending mobile gear, bottom tending static gear, pelagic gear, and other gears. The Northeast region falls within the jurisdiction of the NEFMC and MAFMC as well as the individual states from Maine to North Carolina which are represented by the Atlantic States Marine Fisheries Commission (ASMFC). These jurisdictions are responsible for the management of many different fisheries extending from the upper reaches of the rivers and estuaries out to 200 miles offshore at the limit of the Exclusive Economic Zone (EEZ).

Sixty categories of fishing gear were identified as having been associated with landings of federal or state managed species based on a review of the National Marine Fisheries Service commercial fisheries landings data for 1999 and an ASMFC report on gear impacts to submerged aquatic vegetation (Stephan et al. 2000). Fishing gears considered in this report are those used to land any amount of any species managed by either the NEFMC or MAFMC (Table 327) as well as gears that contributed 1% or more of any individual state's total landings for all species (Table 328). Although certain gear types are not managed under the auspices of the MSA, this methodology recognizes that certain gear utilized in state waters may have adverse impacts to EFH that is designated in nearshore, estuarine and riverine areas. Table 329 provides the list of all 60 gears considered and indicates whether the gear is utilized in estuaries, coastal waters (0-3 miles), or offshore waters (3-200 miles). Since the seabed is the location of the habitat types most susceptible to gear disturbances, Table 329 also indicates whether the gear contacts the bottom and if the use of the gear is regulated under a federal FMP. This report considers gear to be regulated under a federal FMP if it is typically utilized to harvest fish under a federal vessel or operators permit. Table 330 indicates gear used in state-managed fisheries that contact the bottom.

GEAR	Dogfish	Bluefish	Butterfish	Surfclam	Ocean Quahog	Cod, Atlantic	Red Crab	Summer Flounder	Windowpane Flounder	Winter Flounder	Witch Flounder	Yellowtail Flounder	Monkfish	Haddock	Hake, Red	Hake, Silver	Hake, White	Halibut, Atlantic	Herring, Atlantic	Mackerel, Atlantic	Plaice, American	Pollock	Ocean Pout	Redfish	Sea Scallop	Scup	Black Sea Bass	Skates	Squid, Loligo	Squid, Illex	Tilefish
Bag Nets			-																											-	
Beam Trawls, Other		-	-		-					-	-	-	-		-	-									-	-			-		
Cast Nets		-						-																		-					
Combined Gears		-																									-				-
Diving Outfits, Other																									-	-					
Dredge Clam				92	10 0			-		-			-												-	-					
Dredge Conch								-																				-			
Dredge Scallop, Bay										-	-		-												-						
Dredge Scallop, Sea		-	-			-		2	-	-	-	1	16			-	-				-	-			90	-	-	-	-	-	-
Floating Traps (Shallow)		1	-			-		-		-			-			-			-	2		-				9	-	-	-		
Fyke And Hoop Nets, Fish		-	-					-	-	-	-	-	-															-			
Gill Nets, Drift, Other	-	9	-					-		-		-	-		-	-			-	-			-			-	-	-	-		
Gill Nets, Drift, Runaround		5	-																												
Gill Nets, Other		5	-					-					-							-							-	-			
Gill Nets, Sink/Anchor, Other	60	16	-			20		-	-	4	2	6	29	7	-	-	35	8	-	1	2	55	3	16	-	-	-	12	-	-	-
Gill Nets, Stake	-	-	-					-					-						-	-											
Haul Seines, Beach	-	1	-					-		-					-	-			-	-								-			
Haul Seines, Long		-	-																												
Haul Seines, Long(Danish)						-				-	-	-	-	-		-	-				-	-		-				-			
Lines Hand, Other	-	5	-			5		2	-	-	-	-	-	-	-	-	-		-	-	-	-	4	-		12	14	-	-		2
Lines Long Set With Hooks	-	-	-			17		-		-	-	-	-	2	-	-	5	-		-	-	2	7	-	-	-	-	-	-		61
Lines Long, Reef Fish																															32

Lines Troll, Other		-	-					-																			-				-
Lines Troll With Baits								-																							
Otter Trawl Bottom, Fish	38	20	93			57		92	98	95	97	92	53	91	98	99	58	89	2	93	97	42	77	83	-	66	25	86	99	100	4
Otter Trawl Bottom, Scallop		-				-		-		-	-	-	-	-							-	-			9		-	-	-		
Otter Trawl Midwater																			53	-											
Pots And Traps, Conch		-	-			-																	-				-				
Pots And Traps, Crab, Blue		-	-					-																			-				
Pots and Traps, Crab, Blue Peeler		-																													
Pots And Traps, Crab, Other		-					60	-																							
Pots And Traps, Fish		-	-			-		-		-			-		-	-	-		-	-		-	7	-		5	53	-	-		-
Pots And Traps, Lobster Inshore		-	-			-		-		-			-	-	-	-	-			-		-	-	-	-	-	-	-	-		
Pots And Traps, Lobster Ofshore		-	-			-	40	-		-			-		-		-						-	-		-	-		-		-
Pots And Traps, Other		-						-																		-	3				
Pound Nets, Crab		-						-																							
Pound Nets, Fish		5	3			-		2	-	-		-	-		-	-			-	-						-	-	-	-		
Pound Nets, Other		-	-					-		-										2						2	-		-		
Purse Seines, Herring																			31												
Purse Seines, Other		3																													
Reel, Electric or Hydraulic																											-				
Rod and Reel																											-				
Scottish Seine		-	-			-		-	-	-	-	-	-	-	-	-	-			-	-	-	-			-	-	-	-		
Scrapes								-																							
Spears		-																									-				
Stop Seines																			-												
Trawl Midwater, Paired																			14												
Weirs																			-												

Table 1- Percentage of Landings for Federally Managed Species by Fishing Gear Type Used in Northeast Region in 1999

"-" Indicates there was less than 1% landings associated with this gear type for this species

"Blank" Indicates there were no landings recorded for this gear type for this species

	Percent of Landings (1% or more) for All Species by State											
Gear	CT	DE	MA	MD	ME	NC	NH	NJ	NY	RI	VA	% Landings All States Combined
By Hand, Other		18										
Diving Outfits, Other					5							1
Dredge Clam			9	10				39	1	1		6
Dredge Crab		11									1	
Dredge Mussel					1							
Dredge Other					3							
Dredge Scallop, Sea	7		10		1		1	2			1	2
Dredge Urchin, Sea					1							
Floating Traps (Shallow)										1		
Fyke And Hoop Nets, Fish				2								
Gill Nets, Drift, Other		4		3				2				1
Gill Nets, Drift, Runaround						1						
Gill Nets, Other						14						1
Gill Nets, Sink/Anchor,			12	5	1		42	5	5	4	3	4
Gill Nets, Stake		7										
Haul Seines, Beach				2							1	
Haul Seines, Long						1						
Hoes					1							
Lines Hand, Other		1	2	1		1	1		1			1
Lines Long Set With Hooks			4			1		1	4			1
Lines Long, Shark						1						
Lines Troll, Other						1						
Lines Trot With Baits				17								1
Not Coded	16				1			1	30			2
Otter Trawl Bottom, Shrimp					1	6	3					1
Otter Trawl Midwater			11		21		8			18		6
Pots And Traps, Conch		2										
Pots And Traps, Crab, Blue		51		36		36		3			6	8
Pots And Traps, Crab, Other			2							1		
Pots And Traps, Eel		2		1								
Pots And Traps, Fish		1		3								
Pots And Traps, Lobster Inshore	13		5		25		9			4		5
Pots And Traps, Lobster Offshore	2		4				9	1		2		1
Pots And Traps, Other			1		1							
Pound Nets, Crab				1								
Otter Trawl Bottom, Crab						1						
Otter Trawl Bottom, Fish	61		38	3	9	7	26	26	58	56	2	18
Pound Nets, Fish				14		1			1		4	2
Purse Seines, Herring			1		23							4
Purse Seines, Menhaden						27		18			74	28
Purse Seines, Other											7	2

Table 2- Principal Fishing Gears Used in Each State in the Northeast Region in 1999

GEAR	Estuary or Bay	Coastal 0-3 Miles	Offshore 3-200 Miles	Contacts Bottom	Federally Regulated
Bag Nets	X	X	X		X
Beam Trawls	X	X	X	X	X
By Hand	X	X			X
Cast Nets	X	X	X		
Clam Kicking	X			X	
Diving Outfits	X	X	X		
Dredge Clam	X	X	X	X	X
Dredge Conch	X			X	
Dredge Crab	X	X		X	
Dredge Mussel	X	X		X	
Dredge Oyster, Common	X			X	
Dredge Scallop, Bay	X			X	
Dredge Scallop, Sea		X	X	X	X
Dredge Urchin, Sea		X	X	X	
Floating Traps (Shallow)	X	X		X	X
Fyke And Hoop Nets, Fish	X	X		X	
Gill Nets, Drift, Other			X		X
Gill Nets, Drift, Runaround			X		X
Gill Nets, Sink/Anchor, Other	X	X	X	X	X
Gill Nets, Stake	X	X	X	X	X
Haul Seines, Beach	X	X		X	
Haul Seines, Long	X	X		X	
Haul Seines, Long(Danish)		X	X	X	X
Hoes	X			X	
Lines Hand, Other	X	X	X		X
Lines Long Set With Hooks		X	X	X	X
Lines Long, Reef Fish		X	X	X	X
Lines Long, Shark		X	X		X
Lines Troll, Other		X	X		X
Lines Trot With Baits		X	X		X
Otter Trawl Bottom, Crab	X	X	X	X	
Otter Trawl Bottom, Fish	X	X	X	X	X
Otter Trawl Bottom, Scallop		X	X	X	X
Otter Trawl Bottom, Shrimp	X	X	X	X	X
Otter Trawl Midwater		X	X		X
Pots And Traps, Conch	X	X		X	
Pots and Traps, Crab, Blue Peeler	X	X		X	
Pots And Traps, Crab, Blue	X	X		X	
Pots And Traps, Crab, Other	X	X	X	X	X
Pots And Traps, Eel	X	X		X	
Pots and Traps, Lobster Inshore	X	X		X	
Pots and Traps, Lobster Offshore			X	X	X
Pots and Traps, Fish	X	X	X	X	X
Pound Nets, Crab	X	X		X	
Pound Nets, Fish	X	X		X	
Purse Seines, Herring		X	X		X
Purse Seines, Menhaden		X	X		

Purse Seines, Tuna		X	X		X
Rakes	X			X	
Reel, Electric or Hydraulic		X	X		X
Rod and Reel	X	X	X		X
Scottish Seine		X	X	X	X
Scrapes	X			X	
Spears	X	X	X		
Stop Seines	X			X	
Tongs and Grabs, Oyster	X			X	
Tongs Patent, Clam Other	X			X	
Tongs Patent, Oyster	X			X	
Trawl Midwater, Paired		X	X		X
Weirs	X			X	

Table 3- Fishing Gears Used in Estuaries and Bays, Coastal Waters, and Offshore Waters of the EEZ, from Maine to North Carolina

Table 3 includes all gears that accounted for 1% or more of any state's total landings and all gears that harvested any amount of any federally managed species, based upon 1999 NMFS landings data and ASMFC Gear Report (ASMFC 2000). Entries in bold type are gears that are federally managed and contact the bottom.

GEAR	Estuary or Bay	Coastal 0-3 Miles	Offshore 3-200 Miles
Clam Kicking	X		
Dredge Conch	X		
Dredge Crab	X	X	
Dredge Mussel	X	X	
Dredge Oyster, Common	X		
Dredge Scallop, Bay	X		
Dredge Urchin, Sea		X	X
Fyke And Hoop Nets, Fish	X	X	
Haul Seines, Beach	X	X	
Haul Seines, Long	X	X	
Otter Trawl Bottom, Crab	X	X	X
Otter Trawl Bottom, Fish	X	X	X
Pots And Traps, Conch	X	X	
Pots and Traps, Crab, Blue Peeler	X	X	
Pots And Traps, Crab, Blue	X	X	
Pots And Traps, Eel	X	X	
Pots and Traps, Lobster Inshore	X	X	
Pound Nets, Crab	X	X	
Pound Nets, Fish	X	X	
Rakes	X		
Scrapes	X		
Stop Seines	X		
Tongs and Grabs, Oyster	X		
Tongs Patent, Clam Other	X		
Tongs Patent, Oyster	X		
Weirs	X		

Table 4– State-Managed Fishing Gears Used in Estuaries and Bays, Coastal Waters, and Offshore Waters of the EEZ, from Maine to North Carolina that Contact the Bottom
Includes all gears that accounted for 1% or more of any state's total landings and all gears that harvested any amount of any federally managed species, based upon 1999 NMFS landings data and ASMFC Gear Report (ASMFC 2000).

1.2.1 Bottom Tending Mobile Gear

1.2.1.1 Otter Trawls

Trawls are classified by their function, bag construction, or method of maintaining the mouth opening. Function may be defined by the part of the water column where the trawl operates (e.g., bottom) or by the species that it targets (Hayes 1983). There is a wide range of otter trawl types used in the Northeast as a result of the diversity of fisheries prosecuted and bottom types encountered in the region (NREFHSC 2002). The specific gear design used is often a result of the target species (whether they are found on or off the bottom) as well as the composition of the bottom (smooth versus rough and soft versus hard). There are two three components of the otter trawl that come in contact with the sea bottom: the doors, the ground cables and bridles which attach the doors to the wings of the net, and the sweep (or foot-rope) which runs along the bottom of the net mouth. Bottom trawls are towed at a variety of speeds, but average about 5.5 km/hr (3 knots or nmi/hr).

1.2.1.1.1 Doors

The traditional otter board is a flat, rectangular wood structure with steel fittings and a steel "shoe" along the bottom that prevents the bottom of the door from damage and wear as it drags over the bottom. Other types include the V-type (steel), polyvalent (steel), oval (wood), and slotted spherical otter board (steel) (Sainsbury 1996). It is the spreading action of the doors resulting from the angle at which they are mounted that creates the hydrodynamic forces needed to push them apart. These forces also push them down towards the sea floor. On fine-grained sediments, the doors also function to create a silt cloud that aids in herding fish into the mouth of the net (Carr and Milliken 1998). In shallow waters, light-weight doors are typically used to ensure that the doors and the net spread fully. In these cases, light foam-filled doors can be used (Sainsbury 1996). Vessels fishing large nets in deeper water require very large spreading forces from the doors. In these cases, a 15 m^2 (49 ft^2) V-door weighing 640 kg (1480 lbs) can provide 9 metric tons of spreading force (Sainsbury 1996).

1.2.1.1.2 Ground Cables and Bridles

Steel cables are used to attach the doors to the wings of the net. The ground cables run along the bottom from each door to two cables (the "bridle") that diverge to attach to the top and bottom of the net wing. The bottom portion of the bridle also contacts the bottom. In New England, fixed rubber discs ("cookies") or rollers are attached to the ground cables and lower bridle. In general, bridles vary in length from 9 m to 73 m (30 - 200 ft) while ground cables can be from 0 to 73 m (200 ft) depending upon bottom conditions and towing speed (Sainsbury 1996). The length of these cables can therefore increase the area swept by the trawl by as much as three fold.

1.2.1.1.3 Sweeps

On smooth bottoms, the sweep may be a steel cable weighted with chain, or may be merely rope wrapped with wire. On rougher bottoms, rubber discs ("cookies") or rollers are attached to the sweep to assist the trawl's passage over the bottom (Sainsbury 1996). There are two main types of sweep used in smooth bottom in New England (Mirarchi 1998). In the traditional chain sweep, loops of chain are suspended from a steel cable, with only 2-3 links of the chain touching bottom. Contact of the chain with the bottom reduces the buoyancy of the trawl – which would otherwise be negatively buoyant – to the point where it skims along just a few inches above the bottom to catch species like squid and scup that swim slightly above the bottom. The other type of sweep is heavier and is used on smooth bottom to catch flounder. Instead of a cable, rubber cookies stamped from automobile tires are attached to a heavy chain. This type of sweep is always in contact with the bottom. Cookies vary in diameter from 1.5 to 6.5 cm (4 to 16 inches) and do not rotate (Carr and Milliken 1998).

Roller sweeps and rockhoppers are used on irregular bottom (Carr and Milliken 1998). Vertical rubber rollers rotate freely and are as large as 14.5 cm (36 inches) in diameter. In New England, the rollers have been largely replaced with "rockhopper" gear that uses larger fixed rollers and are designed to "hop" over rocks as large as 1 meter in diameter. Small rubber "spacer" discs are placed in between the larger rubber discs in both types of sweep. Rockhopper gear is no longer used exclusively on hard bottom habitats, but is actually quite versatile and used in a variety of habitat types (NREFHSC 2002). "Street-sweepers" were first used in Massachusetts in 1995, replacing heavier rockhopper gear, and consist of circular brushes up to 12.5 cm (31 inches) in diameter. They are lighter than rubber rockhopper gear and can probably fish much rougher bottom than other sweep designs (Carr and Milliken 1998).

Flatfish are primarily targeted with a mid-range mesh flat net that has more ground rigging and is designed to get the fish up off the bottom. A high rise or fly net with larger mesh is used to catch demersal fish that rise higher off the bottom than flatfish (NREFHSC 2002). Crabs, scallops, and lobsters are also harvested in large mesh bottom trawls.

Small mesh bottom trawls are used to capture northern and southern shrimp, whiting, butterfish and squid and usually employ a light chain sweep. Small-mesh trawls are designed, rigged, and used differently than large-mesh fish trawls. Bottom trawls used to catch northern shrimp in the Gulf of Maine, for example, are smaller than most fish trawls and are towed at slower speeds (<2 knots versus 4 knots or so for a fish trawl). Footropes range in length from 12 m to over 30 m (40 - 100 ft), but most are 15 to 27 m (50 - 90 ft). Because shrimp inhabit flatter bottom than many fish do, roller gear tend to be smaller in diameter on shrimp nets because they are not towed over rough bottom (Dan Schick, Maine Dept. of Marine Resources, personal communication). Because shrimp can not be herded in the same manner as fish, footropes on shrimp trawls are bare (no cookies) and are limited to 27 m (90 ft) in length (D. Schick, personal communication). Northern shrimp trawls are also equipped with Nordmore grates in the funnel of the net to reduce the by-catch of groundfish. Southern shrimp trawlers that catch brown and white shrimp typically tow 2-4 small trawls from large booms extended from each side of the vessel (DeAlteris 1998). Northern shrimp trawlers tow a single net astern.

The raised-footrope trawl was designed especially for fishing for whiting, red hake, and dogfish. It was designed to provide vessels with a means of continuing to fish for small mesh species without catching groundfish. In this type of trawl, 1 m (42 inches) long chains connect the sweep to the footrope, which results in the trawl fishing about 0.45 to 0.6 m (1.5-2 ft) above the bottom (Carr and Milliken 1998). The raised footrope and net allows complete flatfish escapement, and theoretically travels over codfish and other roundfish (whiting and red hake tend to swim slightly above the other groundfish). Although the doors of the trawl still ride on the bottom, Carr and Milliken (1998) report that studies have confirmed that the raised footrope sweep has much less contact with the sea floor than does the traditional cookie sweep that it replaces.

An important consideration in understanding the relative effects of different otter trawl configurations is their weight in water relative to their weight in air. Rockhopper gear is not the heaviest type of ground gear used in this region since it loses 80% of its weight in water (i.e., a rockhopper sweep that weighs 1000 pounds on land may only weigh 200 pounds in water) (NREFHSC 2002). Streetsweeper gear is much heavier in the water due to the use of steel cores in the brush components. Plastic-based gear has the smallest weight in water to weight in air ratio (approximately 5%) (NREFHSC 2002). For the same reasons, steel doors are much heavier in water than wooden doors (Mirarchi 1998).

1.2.1.2 Beam Trawls

The beam trawl is much like an otter trawl except the net is spread horizontally by a steel beam that runs the horizontal width of the net rather than with otter boards. The net is spread vertically by heavy steel trawl heads that generally have skid-type devices with a heavy shoe attached (Sainsbury 1996). Beam trawls currently in use in Europe are up to 12 m (40 ft) in width and very heavy, increasing in weight from 3.5 mt (7,700 lbs) in the 1960s to as much as 10 mt (22,000 lbs) in the 1980s (Rogers et al. 1998). Despite the weight of the gear, increased towing power and size of trawlers have allowed towing speeds to reach 14.8 km/hr (8 knots or nmi/hr).

It is believed that beam trawls are not currently used in the Northeast U.S. (NREFHSC 2002). A few beam trawls were used in the 1970s to catch monkfish, but the fishery was unsuccessful. In the mid 1990s, a number of boats off New Bedford, MA used what were referred to as beam trawls, but the gear more closely resembled a scallop dredge rather than the traditional, European beam trawls. There are a few boats that are currently recorded as using beam trawls in the NMFS fishery landings database, but it is believed these were most likely mis-characterized and are actually otter trawls being deployed from the side of the vessels (NREFHSC 2002).

It is unlikely that fishermen would begin using beam trawls in the Northeast U.S. Beam trawls are prevalent in the North Sea where the water is dark and murky and the fisheries target flatfishes, which sit slightly under the sediments. In these fisheries, the beam trawl acts to sieve the fish up off the seafloor. The lack of conventional herding effect and small mouth opening of the beam trawl would not be effective for harvesting U.S. target species. Furthermore, most vessels being used in the Northeastern U.S. do not have the size or power required to handle a beam trawl (NREFHSC 2002). Therefore, beam trawls will not be considered further in this report as a gear type potentially impacting marine habitats off the Northeastern U.S.

1.2.1.3 Hydraulic Clam Dredges

Hydraulic clam dredges have been used in the surfclam (*Spisula solidissima*) fishery for over five decades and in the ocean quahog (*Arctica islandica*) fishery since its inception in the early 1970s. These dredges are highly sophisticated and are designed to: 1) be extremely efficient (80 to 95% capture rate); 2) produce a very low bycatch of other species; and 3) retain very few undersized clams (NREFHSC 2002).

The typical dredge is 3.7 m (12 feet) wide and about 6.7 m (22 feet) long and uses pressurized water jets to wash clams out of the seafloor. Towing speed at the start of the tow is about 4.5 km/hr (2.5 knots or nmi/hr) and declines as the dredge accumulates clams. The dredge is retrieved once the vessel speed drops below about 3 km/hr (1.5 knots), which can be only a few minutes in very dense beds. However, a typical tow lasts about 15 minutes. The water jets penetrate the sediment in front of the dredge to a depth of about 20 - 25 cm (8 - 10 inches), depending on the type of sediment and the water pressure. The water pressure that is required to fluidize the sediment varies from 50 pounds per square inch (psi) in coarse sand to 110 psi in finer sediments. The objective is to use as little water as possible since too much pressure will blow sediment into the clams and reduce product quality. The "knife" (or "cutting bar") on the leading bottom edge of the dredge opening is 14 cm (5.5 inches) deep for surfclams and 8.9 cm (3.5 inches) for ocean quahogs. The knife "picks up" clams that have been separated from the sediment and guides them into the body of the dredge ("the cage"). If the knife size is not appropriate, clams can be cut and broken, resulting in significant mortality of clams left on the bottom. The downward pressure created by the runners on the dredge is about 1 psi (NREFHSC 2002). The high water pressure associated with the hydraulic dredge can cause damage to the flora and fauna associated with bottom habitats.

Before 1990, two types of hydraulic dredges were common in the fishery, stern rig dredges and side rig dredges. A side rig dredge has a chain bag that drags behind the dredge and smooths out the trench created by the dredge. The chain bag results in significantly more damage to small clams and other bycatch than occurs with the stern rig dredge. Currently, most of the dredges in the fishery are stern rig dredges, which are basically giant sieves. Small clams and bycatch fall through the bottom of the cage into the trench and damage or injury to benthic organisms is minimal. Improvements in gear efficiency have reduced bottom time and helped to confine the harvest of surfclams to a relatively small area in the mid-Atlantic Bight (NREFHSC 2002).

Hydraulic clam dredges can be operated in areas of large grain sand, fine sand, sand and small grain gravel, sand and small amounts of mud, and sand and very small amounts of clay. Most tows are made in large grain sand. Dredges are not fished in clay, mud, pebbles, rocks, coral, large gravel greater than one half inch, or seagrass beds (NREFHSC 2002).

In the soft-clam (*Mya arenaria*) fishery, the dredge manifold and blade are located just forward of an escalator, or conveyor belt, that carries the clams to the deck of the vessel. These vessels are restricted to water depths less than one-half the length of the escalator and are typically operated from 15 m (49ft) vessels in water depths of 2-6 m (6.6 - 20 ft) (DeAlteris, 1998). The escalator dredge is not managed under federal fishery management plans. A variation of this type of dredge, the suction dredge, is used in Europe to harvest several bivalve species. Sediment and clams that are dislodged by water pressure are sucked through a hose to the vessel. These dredges are also restricted to shallow water.

1.2.1.4 Sea Scallop Dredges

The New Bedford scallop dredge is the primary gear used in the Georges Bank and mid-Atlantic sea scallop (*Placopecten magellanicus*) fishery and is very different than dredges utilized in Europe and the Pacific because it is a toothless dredge.

The forward edge of the New Bedford dredge includes the cutting bar, which rides above the surface of the substrate, creating turbulence that stirs up the substrate and kicks objects (including scallops) up from the surface of the substrate into the bag. Shoes on the cutting bar are in contact with and ride along the substrate surface (NREFHSC 2002). A sweep chain is attached to each shoe and attaches to the bottom of the ring bag (Smolowitz 1998). The bag is made up of metal rings with chafing gear on the bottom and twine mesh on the top, and drags on the substrate when fished. Tickler chains run from side to side between the frame and the ring bag and, in hard bottom scalloping, a series of rock chains run from front to back to prevent large rocks from getting into the bag (Smolowitz 1998). New Bedford dredges are typically 4.3 m (14 feet) wide; two of them are towed by a single vessel at speeds of 4 to 5 knots. New Bedford dredges used along the Maine coast are smaller. Towing times are highly variable, depending on how many marketable sized scallops are on the bottom and the location.

In the Northeast region, scallop dredges are used in high and low energy sand environments, and high energy gravel environments. Although gravel exists in low energy environments of deepwater banks and ridges in the Gulf of Maine, the fishery is not prosecuted there (NREFHSC 2002).

The leading edge of scallop dredges used in Europe, Australia, and New Zealand to catch other species of scallop that "dig" into the bottom have teeth which dig into the substrate. This type of dredge is used by smaller vessels that are not able to tow a non-toothed dredge fast enough (4-5 knots) to fish effectively (NREFHSC 2002). Some of the European scallop dredges are spring-loaded so that the cutting bar flexes backward when it contacts a hard object on the bottom, then springs back when the dredge passes over the obstacle. These dredges are approximately 0.75 m (2.5 ft) wide and may be fished in gangs of 3-9 dredges on either side of the vessel (Kaiser et al. 1996a). A typical tooth bar bears 9 teeth, 11 cm (4.3 inches) long, spaced about 8 cm (3 inches) apart. French dredges, 2 m (6.6 ft) wide, are not spring-loaded and generally are fished on cleaner ground. They are fitted with a diving vane to improve penetration of the bottom. Scallop dredges used in Australia and New Zealand are heavy, rigid, wire mesh "boxes" that do not have a chain bag (McLoughlin et al. 1991). A very limited amount of scallop dredging with toothed dredges (e.g., the "Digby" dredge) takes place along the U.S. and Canadian coast of the Gulf of Maine.

1.2.1.5 Other Non-Hydraulic Dredges

1.2.1.5.1 Quahog Dredge

Mahogany quahogs (same species, *Arctica islandica*, as harvested in the mid-Atlantic) are harvested in eastern Maine coastal waters using a dredge that is essentially a large metal cage on skis with 15 cm (6 inch) long teeth projecting at an angle off the leading bottom edge (Pete Thayer, Maine Dept. of Marine Resources, personal communication). Maine state regulations limit the length of the cutter bar to 91 cm (36 inches). The teeth rake the bottom and lift the quahogs into the cage. This fishery takes place in small areas of sand and sandy mud found among bedrock outcroppings in depths of 9 to > 76 m (30 - 250 ft) in state and federal coastal waters north of 43°E 20'N latitude. These dredges are used on smaller boats, about 9 - 12 m long (30 to 40 ft) and are pulled through the seabed using the boat's engine (NREFHSC 2002). This dredging activity is managed under a federal fishery management plan.

1.2.1.5.2 Oyster or Crab Dredge/Scrape/Mussel Dredge

The oyster dredge is a toothed dredge consisting of a steel frame 0.5-2.0 m (1.6 -6.6 ft.) in width, a tow chain or wire attached to the frame, and a bag to collect the catch. The bag is constructed of rings and chain-links on the bottom to reduce the abrasive effects of the seabed, and twine or webbing on top. The dredge is towed slowly (<1 m/sec) in circles, from vessels 7 to 30 m (23 - 98 ft.) in length (DeAlteris 1998). Crabs are harvested with dredges similar to oyster dredges. Stern-rig dredge boats (approximately 15 m (49') in length) tow two dredges in tandem from a single chain warp. The dredges are equipped with 10 cm (4 inch) long teeth that rake the crabs out of the bottom. (DeAlteris 1998). The toothed dredge is also used for harvesting mussels (Hayes 1983). These dredging activities are not managed under federal fishery management plans.

1.2.1.5.3 Bay Scallop Dredge

Bay scallops usually reside on the bottom. The bay scallop dredge may be 1 to 1.5 m (3.3 - 4.9 ft.) wide and about twice as long. The simplest bay scallop dredge can be just a mesh bag attached to a metal frame that is pulled along the bottom. For bay scallops that are located on sand and pebble bottom, a small set of raking teeth are set on a steel frame, and skids are used to align the teeth and the bag (Sainsbury 1996). This dredging activity is not managed under federal fishery management plans.

1.2.1.5.4 Sea Urchin Dredge

Similar to a simple bay scallop dredge, the sea urchin dredge is designed to avoid damaging the catch. It has an up-turned sled-like shape at the front that includes several leaf springs tied together with a steel bar. A tow bail is welded to one of the springs and a chain mat is rigged behind the mouth box frame. The frame is fitted with skids or wheels. The springs act as runners, enabling the sled to move over rocks without hanging up. The chain mat scrapes up the urchins. The bag is fitted with a codend for ease of emptying. This gear is generally only used in waters up to 100 m (330 ft.) deep (Sainsbury 1996). This dredging activity is not managed under federal fishery management plans.

1.2.1.5.5 Clam "Kicking"

Clam kicking is a mechanical form of hard clam harvest practiced in North Carolina which involves the modification of boat engines so that the propeller is directed downwards instead of backwards (Guthrie and Lewis 1982). In shallow water the propeller wash is powerful enough to suspend bottom sediments and clams into a plume in the water column, which allows them to be collected in a trawl net towed behind the boat (Stephan et al. 2000). This activity is not managed under federal fishery management plans.

1.2.2 Seines

1.2.2.1 Haul Seines

Haul seining is a general term describing operations where a net is set out between the surface and sea bed to encircle fish. It may be undertaken from the shore (beach seining), or away from shore in the shallows of rivers, estuaries or lakes (Sainsbury 1996). Seines typically contact the sea bottom along the lead line. Additionally the net itself may scrape along the bottom as it is dragged to shore or the recovery vessel. This activity is not managed under federal fishery management plans.

1.2.2.1.1 Beach Haul Seines

The beach seine resembles a wall of netting of sufficient depth to fish from the sea surface to the sea bed, with mesh small enough that the fish do not become gilled. A floatline runs along the top to provide floatation and a leadline with a large number of weights attached ensures that the net maintains good contact with the bottom. Tow lines are fitted to both ends. The use of a beach seine generally starts with the net on the beach. One end is pulled away from the beach, usually with a small skiff or dory, and is taken out and around and finally back in to shore. Each end of the net is then pulled in towards the beach, concentrating the fish in the middle of the net. This is eventually brought onshore as well and the fish removed. This gear is generally used in relatively shallow inshore areas. (Sainsbury 1996). This activity is not managed under federal fishery management plans.

1.2.2.1.2 Long Haul Seines

The long haul seine is set and hauled in shallow estuarine and coastal areas from a boat typically 15 m (49 ft.) long. The net is a single wall of small mesh webbing less than 5 cm (2 inches), and is usually greater than 400 m (1440 ft.) in length and about 3 m (9.8 ft.) in depth. The end of the net is attached to a pole driven into the bottom, and the net is set in a circle so as to surround fish feeding on the tidal flat. After closing the circle, the net is hauled into the boat, reducing the size of the circle, and concentrating the fish. Finally, the live fish are brailed or dip-netted out of the net. (DeAlteris 1998). This activity is not managed under federal fishery management plans.

1.2.2.2 Stop Seines

These are seines that are used in coastal embayments to close off the opening to a small cove or bight. This method is used in Maine to harvest schools of juvenile herring (Everhart and Youngs 1981). This activity is not managed under federal fishery management plans.

1.2.2.3 Danish and Scottish Seines

Danish or Long seining (anchor dragging) was developed in the 1850s prior to the advent of otter trawling. The Danish seine is a bag net with long wings, that includes long warps set out on the seabed enclosing a defined area. As the warps are retrieved, the enclosed area (a triangle) reduces in size. The warps dragging along the bottom herd the fish into a smaller area, and eventually into the net mouth. The gear is deployed by setting out one warp, the net, then the other warp. On retrieval of the gear, the vessel is anchored. This technique of fishing is aimed at specific schools of fish located on smooth bottom. In contrast to Danish seining, if the vessel tows ahead while retrieving the gear, then this is referred to as Scottish seining or fly-dragging. This method of fishing is considered more appropriate for working small areas of smooth bottom, surrounded by rough bottom. Scottish and Danish seines have been used experimentally in U.S. demersal fisheries. Space conflicts with other mobile and fixed gears, have precluded the further development of this gear in the U.S., as compared to Northern Europe (DeAlteris 1998). This activity is managed under federal fishery management plans.

1.2.3 Bottom-Tending Static Gear

1.2.3.1 Pots

Pots are portable, rigid devices that fish and shellfish enter through small openings, with or without enticement by bait (Everhart and Youngs 1981; Hubert 1983). They are used to capture lobsters, crabs, black sea bass, eels and other bottom dwelling species seeking food or shelter (Everhart and Youngs 1981; Hubert 1983). Pot fishing can be divided into two general classifications: 1) inshore potting in estuaries, lagoons, inlets and bays in depths up to about 75 m (250 ft.) and; 2) Offshore potting using larger and heavier vessels and gear in depths up to 730 m (2400 ft.) or more (Sainsbury 1996).

1.2.3.1.1 Lobster Pots

Lobster pots are typically rectangular and are divided into two sections, the chamber and the parlor. The chamber has an entrance on both sides of the pot and is usually baited. Lobsters then move to the parlor via a tunnel (Everhart and Youngs 1981). Escape vents are installed in both areas of the pot to minimize the retention of sub-legal sized lobsters (DeAlteris 1998).

Lobster pots are fished as either 1) a single pot per buoy (although two pots per buoy are used in Cape Cod Bay, and three pots per buoy in Maine waters), or 2) a "trawl" or line with up to 100 pots. According to NREFHSC (2002) there are a number of important features related to lobster pots and their use:

- About 95% of lobster pots are made of plastic-coated wire.
- Floating mainlines may be up to 7.6 m (25 ft.) off bottom.
- Sinklines are sometimes used where marine mammals are a concern.
- Neutrally buoyant lines may soon be required in Cape Cod Bay.
- Soak time depends on season and location - usually 1-3 days in inshore waters in warm weather, to weeks in colder waters.
- Offshore pots are larger (more than 1 m (4 ft) long) and heavier (~ 100 lb or 45 kg), with an average of ~ 40 pots/trawl and 44 trawls/vessel. They have a floating mainline and are usually deployed for a week at a time.
- There has been a three-fold increase in lobster pots fished since the 1960s, with more than four million pots now in use.

Although the offshore component of the fishery is regulated under federal rules, American lobster is not managed under a federal fishery management plan.

1.2.3.1.2 Fish Pots

Black sea bass pots are similar in design to lobster pots. They are usually fished singly or in trawls of up to 25 pots, in shallower waters than the offshore lobster pots or red crab pots. Pots may be set and retrieved 3-4 times per day when fishing for scup (NREFHSC 2002). This activity is managed under a federal fishery management plan. Hagfish pots (55 gallon plastic barrels fitted with a number of one-way entrance funnels) are fished in deep waters on mud bottoms. They are fished in strings of 20-200 traps and set for about six to twelve hours. Cylindrical pots are typically used for capturing eels in Chesapeake Bay, however, half-round and rectangular pots are also used and all are fished in a manner similar to that of lobster pots (Everhart and Youngs 1981). Hagfish and eel activities are not managed under a federal fishery management plan.

1.2.3.1.3 Crab Pots

Crabs are often fished with pots consisting of a wire mesh. A horizontal wire partition divides the pot into an upper and lower chamber. The lower chamber is entered from all four sides through small wire tunnels. The partition bulges upward in a fold about 20 cm (8 inches) high for about one third of its width. In the top of the fold are two small openings that give access to the upper chamber (Everhart and Youngs 1981).

Crab pots are always fished as singles and are hauled by hand from small boats, or with a pot hauler in larger vessels. Crab pots are generally fished after an overnight soak, except early and late in the season (DeAlteris 1998). These pots are also effective for eels (Everhart and Youngs 1981). This activity is not managed under a federal fishery management plan.

Deep sea red crab pots are typically wood and wire traps 1.2 m by 0.75 m (48 by 30 inches) with top entry. Pots are baited and soak for about 22 hours before being hauled. Currently, vessels are using an average of 560 pots in trawls of 75- 180 pots per trawl along the continental slope at depths from 400 to 800 m (1300 - 2600 ft). These vessels are typically 25 - 41 m (90 - 150 ft) in length. Currently there are about 6 vessels engaged in this fishery (NEFMC 2002). This activity is managed under a federal fishery management plan.

1.2.3.2 Traps

A trap is generally a large scale device that uses the seabed and sea surface as boundaries for the vertical dimension. The gear is installed at a fixed location for a season, and is passive, as the animals voluntarily enter the gear. Traps are made of a leader or fence, that interrupts the coast parallel migratory pattern of the target prey, a heart or parlor that leads fish via a funnel into the bay or trap section that serves to hold the catch for harvest by the fishermen. The non-return device is the funnel linking the heart and bay sections (DeAlteris 1998). This activity is not managed under a federal fishery management plan.

1.2.3.2.1 Fish Pound Nets

Pound nets are constructed of netting staked into the sea bed by driven piles (Sainsbury 1996). Pound nets have three sections: the leader, the heart, and the pound. The leader (there may be more than one) may be as long as 400 m (1300 ft) and is used to direct fish into the heart(s). One or more hearts are used to further funnel fish into the pound and prevent escapement. The pound may be 15 m (49 ft) square and holds the fish until the net is emptied. These nets are generally fished in waters less than 50 m (160 ft) deep. Pound nets are also used to catch crabs. This activity is not managed under a federal fishery management plan.

1.2.3.2.2 Fyke and Hoop Nets

Constructed of wood or metal hoops covered with netting, hoop nets are 2.5 to 5 m (8.2 - 16 ft) long, "Y-shaped" nets, with wings at the entrance and one or more internal funnels to direct fish inside, where they become trapped. Occasionally, a long leader is used to direct fish to the entrance. Fish are removed by lifting the rear end out of the water and loosening a rope securing the closed end. These nets are generally fished to about 50 m (160 ft) deep (Sainsbury 1996). A common fyke net is a long bag mounted on one or several hoops which keep the net from collapsing as well as provide an attachment for the base of the net funnels to prevent the fish from escaping. This gear is used in shallow water and extensively in river fisheries. (Everhart and Youngs 1981). This activity is not managed under a federal fishery management plan.

1.2.3.2.3 Weirs

A weir is a simple maze that intercepts species that migrate along the shoreline. Brush weirs are used in the Maine sardine/herring fishery. These are built of wooden stakes and saplings driven into the bottom in shallow waters. The young herring encounter the lead, which they follow to deeper water, finally passing into an enclosure of brush or netting. The concentrated fish are then removed with a small seine (Everhart and Youngs 1981). This activity is not managed under a federal fishery management plan.

1.2.3.2.4 Shallow Floating Traps

In New England, much of the shoreline and shallow subtidal environment is rocky and stakes can not be driven into the bottom. Therefore, the webbing of these traps is supported by floats at the sea surface, and held in place with large anchors. These traps are locally referred to as "floating traps." The catch, design elements and scale of these floating traps is similar to pound nets (DeAlteris 1998).

The floating trap is designed to fish from top to bottom, and is built especially to suit its location. The trap is held in position by a series of anchors and buoys. The net is usually somewhat "T-shaped," with the long portion of the net (the leader net) designed to funnel fish into a box of net at the top of the T. The leader net is often made fast to a ring bolt ashore (Sainsbury 1996). This activity is not managed under a federal fishery management plan.

1.2.4 Sink Gill Nets and Bottom Longlines

1.2.4.1 Sink/Anchor Gill Nets

Individual gill nets are typically 91 m (300 feet) long, and are usually fished as a series of 5-15 nets attached end-to-end. Gill nets have three components: leadline, webline and floatline. Fishermen are now experimenting with two leadlines. Leadlines used in New England are ~65 lb (30 kg.)/net; in the Middle Atlantic leadlines may be heavier. Weblines are monofilament, with the mesh size depending on the target species. Nets are anchored at each end, using materials such as pieces of railroad track, sash weights, or Danforth anchors, depending on currents. Anchors and leadlines have the most contact with the bottom. Some nets may be tended several times/day, (e.g., when fishing for bluefish in the Middle Atlantic). For New England groundfish, frequency of tending ranges from daily to biweekly (NREFHSC 2002). These activities are managed under federal fishery management plans.

1.2.4.2 Stake Gill Nets

Generally a small boat is used inshore so that a gill net is set across a tidal flow and is lifted at slack tide to remove fish. Wooden or metal stakes run from the surface of the water into the sediment and are placed every few meters along the net to hold it in place. When the net is lifted, the stakes remain in place. These nets are generally fished from the surface to about 50 meters deep (Sainsbury 1996). These activities are not managed under federal fishery management plans.

1.2.4.3 Bottom Longlines

Longlining for bottom species on continental shelf areas and offshore banks is undertaken for a wide range of species including cod, haddock, dogfish, skates, and various flatfishes (Sainsbury 1996). A 9.5 m (31 ft) vessel can fish up to 2500 hooks a day with a crew of one and twice that number with 2 crew members. Mechanized longlining systems fishing off larger vessels up to 60 m (195 ft) can fish up to 40,000 hooks per day (Sainsbury 1996).

In the Northeast up to six individual longlines are strung together, for a total length of about 460 m (1500 ft), and are deployed with 20-24 lb (9 - 11 kg) anchors. The mainline is parachute cord or sometimes stainless steel wire. Gangions (lines from mainline to hooks) are 38 cm (15 inches) long and 1-2 m (3-6 ft) apart. The mainline, hooks, and gangions all come in contact with the bottom. Circle hooks are potentially less damaging to habitat features than other hook shapes. These longlines are usually set for only a few hours at a time (NREFHSC 2002). Longlines used for tilefish are deployed in deep water, may be up to 40 km (25 miles) long, are stainless steel or galvanized wire, and are set in a zig-zag fashion (NREFHSC 2002). These activities are managed under federal fishery management plans.

1.2.5 Pelagic Gear

1.2.5.1 Mid-Water Otter Trawl

The mid-water trawl is used to capture pelagic species that school between the surface and the sea bed throughout the water column. The mouth of the net can range from 110 m to 170 m (360 - 560 ft.) and requires the use of large vessels (Sainsbury 1996). Successful mid-water trawling requires the effective use of various electronic aids to find the fish and maneuver the vessel while catching them (Sainsbury

1996). This activity is managed under federal fishery management plans. This gear is not expected to have contact with or impacts upon bottom habitats.

1.2.5.2 Paired Mid-Water Trawl

Pair-trawling is used by smaller vessels which herd small pelagics such as herring and mackerel into the net (Sainsbury 1996). Large pelagic species are also harvested with a huge pelagic pair trawl towed at high speed near the surface. The nets have meshes exceeding 10 m (33 ft.) in length in the jibs and first belly sections, and reduce to cod-end mesh sizes of 20 cm (8 inches) (DeAlteris 1998). This activity is managed under federal fishery management plans. This gear is not expected to have contact with or impacts upon bottom habitats.

1.2.5.3 Purse Seines

Purse seines are very efficient for taking pelagic schooling species. The purse seine is a continuous deep ribbon of web with corks on one side and leads on the other. Rings are fastened at intervals to the lead line and a purse line runs completely around the net through the rings (Everhart and Youngs 1981). One end of the net is fastened to the vessel and the other end to a skiff. The vessel then encircles a school of fish with the net, the net pursed and hauled back to the vessel. Purse seines vary in size according to the vessel size, the size of the mesh, the species sought and the depth to be fished. Tuna seines are nearly one kilometer (0.6 miles) long and fish from 55 - 640 m (180 - 2100 ft.) (Everhart and Youngs 1981). Due to the large depth of the net for tuna purse seines, they have been shown to contact and interact with the sea bottom when fishing in some shallow water locations such as Massachusetts Bay and vicinity (NMFS 2001). However, these interactions are unintended and rare. This activity is managed under federal fishery management plans.

1.2.5.4 Drift Gill Nets

Gillnets operate principally by wedging and gilling fish, and secondarily by entangling (DeAlteris 1998). The nets are a single wall of webbing, with float and lead lines. Drift gillnets are designed so as to float from the sea surface and extend downward into the water column and are used to catch pelagic fish. In this case the buoyancy of the floatline exceeds the weight of the leadline. Drift gillnets may be anchored at one end or set-out to drift, usually with the fishing vessel attached at one end (DeAlteris 1998). This activity is managed under federal fishery management plans. This gear is not expected to have contact with or impacts upon bottom habitats.

1.2.5.5 Pelagic Longline Gear

The pelagic or subsurface longline is a technique directed mostly towards tunas, swordfish, sailfish, dolphin (dorado), and sharks. The gear is typically set at depths from the surface to around 330 m (1100 ft.). The gear can also be set with a main line hanging in arcs below the buoy droplines to fish a band of depths (Sainsbury 1996). The gear is set across an area of known fish concentration or movement, and may be fished by day or night depending upon the species being sought (Sainsbury 1996). The length of the mainline can vary up to108 km (67 miles) depending on the size of the vessel. If the mainline is set level at a fixed depth, then the leader or gangion lengths vary from 2-40 m (6.6 - 130 ft.), so as to ensure the hooks are distributed over a range of depths (DeAlteris 1998). If a line-shooter is used to set the mainline in a catenary shape with regard to depth, then the gangions are usually a single minimal length, but are still distributed by depth (DeAlteris 1998). Each gangion typically contains a baited hook and chemical night stick to attract the fish. Traditional or circle hooks may be used. Swordfish vessels typically fish 20 to 30 hooks per 1.6 km (1 mile) of mainline between 5 and 54 km (3 - 34 miles) in length (Sainsbury 1996). This activity is managed under federal fishery management plans. This gear is not expected to have contact with or impacts upon bottom habitats.

1.2.5.6 Troll Lines

Trolling involves the use of a baited hook or lure maintained at a desired speed and depth in the water (Sainsbury 1996). Usually, two to four or more lines are spread to varying widths by the use of outrigger poles connected to the deck by hinged plates. Line retrieval is often accomplished by means of a mechanized spool. Each line is weighted to reach the desired depth and may have any number of leaders attached, each with a hook and bait or appropriate lure. This gear is generally fished from the surface to about 20 meters (Sainsbury 1996). This activity is managed under federal fishery management plans. This gear is not expected to have contact with or impacts upon bottom habitats.

1.2.6 Other Gear

1.2.6.1 Rakes

A bull rake is manually operated to harvest hard clams and consists of a long shaft with a rake and basket attached. The length of the shaft can be variable but usually does not exceed three times the water depth. The length and spacing of the teeth as well as the openings of the basket are regulated to protect juvenile clams from harvest (DeAlteris 1998). Rakes are typically fished off the side of a small boat. This activity is not managed under federal fishery management plans.

1.2.6.2 Tongs

Tongs are a more efficient device than rakes for harvesting shellfish. Shaft-tongs are a scissor-like device with a rake and basket at the end of each shaft. The fisherman stands on the edge of the boat and progressively opens and closes the baskets on the bottom gathering the shellfish into a mound. The tongs are closed a final time, brought to the surface, and the catch emptied on the culling board for sorting. The length of the shaft must be adjusted for water depth. Oysters are traditionally harvested with shaft tongs in water depths up to 6 m (21 ft.), with shaft tongs 8 m (29 ft.) in length (DeAlteris 1998). Patent tongs are used to harvest clams and oysters and are opened and closed with a drop latch or with a hydraulic ram and require a mechanized vessel with a mast or boom and a winch (DeAlteris 1998). Patent tongs are regulated by weight, length of teeth, and bar spacing in the basket. This activity is not managed under federal fishery management plans

1.2.6.3 Line Fishing

1.2.6.3.1 Hand Lines

The simplest form of hook and line fishing is the hand line. It consists of a line, sinker, leader and at least one hook. The line is usually stored on a small spool and rack and can vary in length. The line varies in material from a natural fiber to synthetic nylon. The sinkers vary from stones to cast lead. The hooks are single to multiple arrangements in umbrella rigs. An attraction device must be incorporated into the hook, usually a natural bait and artificial lure (DeAlteris 1998). Although not typically associated with bottom impacts, this gear can be fished in such as manner so as to hit bottom and bounce or be carried by currents until retrieved. This activity is managed under federal fishery management plans.

1.2.6.3.2 Mechanized Line Fishing

Mechanized line hauling systems have been developed to allow more lines to be worked by smaller crews and use electrical or hydraulic power to work the lines on the spools or jigging machines (Sainsbury 1996). These reels, often termed bandits, are mounted on the vessel bulwarks and have a spool around which the mainline is wound (Sainsbury 1996). Each line may have a number of branches and baited hooks, and the line is taken from the spool over a block at the end of a flexible arm. This gear is used to target several species of groundfish, especially cod and pollock and it has the advantage of being effective in areas where other gears cannot be used. Jigging machine lines are generally fished in waters up to 600 m (2000 ft) deep (Sainsbury 1996). This gear may also have the ability to contact the bottom depending upon the method selected to fish. This activity is managed under federal fishery management plans.

1.2.6.4 Hand Hoes

Intertidal flats are frequently harvested for clams and baitworms using hand-held hoes. These are short handled rake-like devices, which are often modified gardening tools (Creaser et. al. 1983). Baitworm hoes have 5 to 7 tines, 21 to 22 cm (8.3 - 8.7 ft) in length for bloodworms and 34 to 39 cm (13 - 15 inches) for sandworms. Clam hoes in Maine typically have 4 to 5 tines, 15 cm (6 inches) long (Wallace 1997). This activity is not managed under federal fishery management plans.

1.2.6.5 Diving

By either free diving or using SCUBA, divers collect crustaceans, mollusks and some reef fish in shallow water. Most often a support vessel is used to transport the diver(s) to the fishing site and carry the landings to port. In deeper waters, helmet diving systems are used and the diver is tethered to the vessel with air pumped from the surface. This method is most often used by sea urchin divers and some lobster divers. Divers normally use small rakes or hoes to scrape creatures off rocks or dig them out of the seabed. Generally, the catch is placed in bags which are either towed to the surface by the boat or floated to the surface using an air source and a lift bag. Divers rarely work deeper than about 20 m (66 ft) (Sainsbury 1996). This activity is not managed under federal fishery management plans.

1.2.6.6 Spears

Spears came into use when it was found that a pole or shaft with a point on it could be used by a fisherman operating from shore, floating raft, or boat to capture animals previously out-of-reach (DeAlteris 1998). However, the single prong spear required an accurate aim, and fish easily escaped. With the addition of a barb, fish retention was improved; and spears with multi-prong heads increased the likelihood of hitting the target. Spears were initially hand-held, then thrown, then placed in launching devices including cross-bows, spear guns for divers, etc. Spears with long shafts (gigs) are used by fishermen in small boats at night in the Carolina sounds for flounder, through the ice for eels in New England bays, and by divers for fish in coastal waters (DeAlteris 1998). This activity is not managed under federal fishery management plans.

1.3 Distribution of fishing activity by gear type

1.3.1 Introduction

This section of the document includes a series of GIS figures showing the distribution of fishing activity during 1995-2001 by ten minute "squares" of latitude and longitude for six commercial fishing gears that are extensively used in the U.S. Northeast region. Three of them (bottom trawls, scallop dredges, and hydraulic clam dredges) are mobile bottom-tending gears and three (pots, bottom gill nets, and bottom longlines) are fixed bottom-tending gears. Gillnets are also used to harvest monkfish that are managed by the New England Fishery Management Council. Monkfish are also caught incidentally (as by-catch) in pots, scallop dredges, and clam dredges. Also included in this section of the DEIS is an analysis of fishing activity for each gear type among four sub-regions and by surface sediment type within each sub-region and for the region as a whole.

1.3.2 Data Sources and Processing

The data used to perform this analysis were extracted from vessel trip report and clam logbook databases maintained at the U.S. National Marine Fisheries Service (NMFS) Northeast (NE) Regional Office in Gloucester, MA. Data included in the analysis are provided by vessels operating with federal permits that participate in the following fisheries: northeast multispecies; sea scallops; surf clams and ocean quahogs; monkfish; summer flounder; scup; black sea bass; squid, mackerel, and butterfish; spiny dogfish; bluefish; Atlantic herring; and tilefish. Vessels that operate strictly within state waters (generally inside three miles from shore) are not required to have a federal permit and therefore do not submit trip reports. For this reason, fishing trips in some nearshore ten minute squares that include a significant proportion of state waters are under-represented.

Permit holders are required to fill out a VTR form or make a logbook entry for each trip made by the vessel, i.e., each time the vessel leaves and returns to port. In cases where more than one statistical area is fished or the gear is changed during the same trip, a separate report is completed. Fishermen are given the choice of reporting the location of a trip as a point (latitude and longitude or Loran bearings) or just as a statistical area. Only trips that were reported as a point location and therefore could be assigned to a 10 minute square were included in this analysis. Most trips are reported this way. Fishermen report the general location where most of their fishing effort occurred during a trip and the date and time that the vessel left and returned to port. They are also asked to record the number of hauls (tows or sets) made during the trip and the average tow or soak time when the gear was fishing, but this information was judged to be too unreliable and incomplete for use in this analysis. Logbook entries in the clam dredge fishery include time spent fishing and these data were used in this analysis.

VTR and logbook data used in this analysis were compiled for the years 1995-2001. Scallop dredge and otter trawl fishing activity was calculated as the total number of days absent from port during the seven-year period. Days absent for each mobile gear trip were calculated based on the date and time of departure from and return to port in hours and converted to fractions of 24-hr days. Hydraulic clam dredge fishing activity was calculated as days (24 hrs) spent fishing based on the number of hours spent on each trip and excluded trips made by "dry" quahog dredge vessels in Maine. Fishing activity for the three fixed gear types was expressed as the number of trips reported in each ten minute square (TMS).

Days absent calculations for trawl and dredge vessels are clearly preferable to simply summing the number of trips, but over-estimate actual fishing time since they include travel time and any other non-fishing-related activity while vessels are away from port. Thus, the GIS plots and analyses presented here do not represent fishing effort. They were only used to indicate the relative, not the absolute, distribution of fishing activity by geograhical area and sediment type. Toward this end, all GIS input data were compiled and sorted into three categories: low, medium, and high degrees of activity that corresponded to cumulative percentages of 90, 75, and 50% of the total number of days at sea, or days spent fishing for each gear type during the seven-year time period. Data reported from TMS south of Cape Hatteras, North Carolina (35° N) and north of 45° N latitude in the Gulf of Maine were excluded from analysis, as were TMS-binned data from the low end (cumulative percentages >90%) of the frequency distribution. Exclusion of "low end" data (TMS with only a few trips or days) eliminated a large number of spatially misreported trips from analysis.

Also included in this section are GIS plots of fishing activity for scallop dredge vessels operating in the limited access fishery during 1998, 1999, and 2000 which were derived from vessel monitoring systems (VMS) placed aboard each vessel (Rago and McSherry 2001). These plots provide a much more detailed depiction of fishing activity for dredge vessels during these three years than VTR data since they are collected at much higher spatial and temporal resolutions. Data were collected at 20-minute intervals during the time when vessel speed was less than 5 knots in order to differentiate between fishing activity and steaming time and then binned into one nautical mile squares. It is recognized that fishing activity includes other activities besides dredging, e.g., shucking time.

1.3.3 Data Analysis

In each plot, the number of trips or days that accounted for 90% (cumulative) of the total number of trips or days was given as "N" in the title of each figure. Depth contours shown in these figures are for 50 and 100 fathoms. The U.S.-Canada border is shown as a black line and the outer boundary of the U.S. Exclusive Economic Zone (EEZ) is also shown. Ten minute squares that account for 90% of total fishing activity (i.e., all the TMS shown in the low, medium, and high distribution plots) were overlaid as open TMS on sediment types in a second series of GIS plots for each gear type. The surficial sediment layer was modified from a GIS data layer originally made available as a series of hard copy maps by Poppe et al. (1989) and available on a USGS CD-ROM. The original data layer included nine sediment types. For this analysis, silt and clay sediment categories were re-defined as "mud." This resulted in a simplified set of six sediment categories, which were re-named bedrock, gravel, gravelly sand, sand, muddy sand, and mud (Figure 206).

Data were allocated to TMS within the Northeast region (delimited by 35° N latitude) and to four sub-regions, the Gulf of Maine (GOM), Georges Bank (GB), southern New England (SNE), and the Mid-Atlantic (MA). These sub-regions are shown in Figure 207. Each sub-region, and the NE region of which each formed a part, were bounded inshore to exclude state waters and offshore by the 500 fathom depth contour. Boundaries between sub-regions were defined along ten minute parallels of latitude and meridians of longitude so that the only partial TMS were those that intersected with either the inshore or offshore limits of the region. Input files of VTR and logbook data were joined with shape files for each sub-region and the number of trips, days at sea, or days fishing, and the area (in square decimal degrees) encompassed by all the TMS – or portions of TMS – in each fishing activity category (50, 75, and 90%), were calculated.

For the "low" (90%) level of fishing activity, the percentage of the total number of trips or days that occurred in each sub-region during the six or seven-year time period was calculated. Also, the spatial extent to which each sub-region (and the entire NE region) was "fished" by each gear type was calculated as the proportion of the total area within each sub-region that was included within all the designated TMS. For bottom trawls, the amount of closed area on GB and in SNE was deducted from the total area in each sub-region. (All the other gear types had access to these areas for all or a portion of the 1995-2001 time period).

It is important to understand that all calculations involving "area fished" grossly over-estimate the amount of bottom area actually affected by fishing because bottom-tending gear in most cases are not used throughout any given TMS that was assigned to a fishing activity category. This would be particularly true for TMS at the low (90%) end of the distribution, i.e., TMS in which fishing activity is very sparse. Area analyses were only intended to reveal relative differences in the degree of fishing activity between gear types and sub-regions.

Analyses of percent area "fished" were conducted for each gear type and sub-region in terms of the percentage of the total area of each sediment type present in each sub-region was "fished" at the 90% level. These analyses were limited by the very general nature of the available sediment coverage data, and, as mentioned above, by the fact that fishing may take place within a relatively small proportion of the area within a TMS (which covers about 77 square nautical miles), and on a bottom type that either makes up a small proportion of the whole TMS or isn't even represented in the sediment database.

1.3.4 Results

1.3.4.1 Bottom Gill Nets

Bottom gill net trips were made primarily in the GOM (Figure 213 and Figure 214). In none of the other three sub-regions did gill net trips exceed 25% of the total number of gill net trips reported for the entire Northeast region. Gill net trips were reported from a larger area of federal waters in the Northeast region than pot or longline trips (Figure 213). Ten minute squares (TMS) where 90% of the gill net trips were made extended over a larger proportion of the GOM and a smaller proportion of GB, with intermediate values in SNE and the MA sub-regions. Gill net trips were most common in coastal waters in the southwestern portion of the GOM, with some trips reported offshore in the central portion of the gulf (Figure 208). No gill net fishing was reported in coastal waters of central and eastern Maine. Outside the GOM, gill net trips were reported along the western edge of the Great South Channel, in Rhode Island coastal waters, along the south shore of Long Island, and off New Jersey, the Delaware-Maryland-Virginia (DelMarVa) peninsula, and North Carolina. A few trips were also made in three TMS along the 100 f contour at the shelf break in SNE and (apparently) in a single TMS in even deeper water southeast of Hudson Canyon. Gill net trips were more numerous during 1995-2001 than bottom longline trips, but not as numerous as pot trips.

Ten minute squares that accounted for 90% of the gill net fishing trips during 1995-2001 were associated with a higher percentage of sand, gravelly sand, and gravel in the Northeast region than was the case for the other two fixed gear types (Figure 215). All three fixed gear types were used to a much greater extent on mud bottom in the GOM and on sand in the other three sub-regions, reflecting the distribution of sediment types by sub-region (Figure 214). Gill net trips were more strongly associated with coarser sediments in the GOM, SNE, and the MA and with mud and muddy sand in the GB sub-region (Figure 214).

1.3.4.2 Bottom Longlines

Bottom longlining during 1995-2001 was conducted primarily in coastal waters of the southwestern GOM and extended southeast of Cape Cod along the western edge of the Great South Channel Figure 209). A few trips were also reported on the northern edge of GB, in the outer portion of the GOM, in SNE coastal waters, and at scattered locations along the outer continental shelf. Almost all longline trips were reported in the GOM and GB sub-regions, with approximately twice as many in GB (Figure 213). The proportion of each sub-region where 90% of the longline trips were reported diminished from north to south. Of the three fixed gear types, longlines accounted for fewer trips during 1995-2001 than pots or bottom gill nets. Longline trips were also reported from TMS that occupied a smaller percentage of the Northeast shelf area than pot or gill net trips (Figure 208).

Like the other two fixed gear types, bottom longline trips were most commonly reported from TMS in sandy bottom areas, but in relation to the areal extent of each sediment type present in the NE region, longlining was more closely associated with gravelly sand and gravel (Figure 215). Longlining was reported from a very low proportion of mud in the GOM and GB sub-regions, and from a high proportion of sand in the GOM and gravelly sand and gravel areas in the GB sub-region (Figure 214). The low number of trips in SNE were more strongly associated with gravelly sand than with any other sediment type.

1.3.4.3 Pots

Pot fishing trips were distributed primarily throughout GOM coastal waters and in SNE (Figure 213). Trips were also reported from a few TMS along the U.S.-Canada border in the GOM, along the shelf break, and in inshore locations in the New York Bight and southern New Jersey and off the DelMarVa peninsula. Lobster pots accounted for 90% of the total number of trips and dominated pot fishing activity in the GOM and SNE. Hagfish pots (not shown) were used in more offshore waters of the GOM, fish pots (not shown) primarily in coastal SNE waters and in a large area of the mid-Atlantic between southern New Jersey and Cape Henry, and at the tip of the DelMarVa peninsula, and conch and whelk pots (not shown) in Nantucket Sound and off the DelMarVa peninsula. Crab pot trips (not shown) were reported from a number of scattered TMS, but there was a cluster on the southeastern flank of GB and inside the North Carolina barrier islands. The analysis of total pot fishing trips by sub-region – which excludes some data from TMS located inside state waters – revealed, not surprisingly, that most trips were reported in the GOM sub-region (Figure 213). Of the other three sub-regions, SNE accounted for more trips and area than the other two sub-regions, although a notable percentage of the area (but not number of trips) represented by the 90% TMS occurred in the mid-Atlantic sub-region. The extent of pot fishing in the GB sub-region during 1995-2001 was negligible.

Pot fishing trips occurred most often on mud bottom in the GOM and on sand in the other three sub-regions (Figure 214). In proportion to the amount of each sediment type present in each sub-region, pot fishing was more closely associated with sand, gravelly sand, and gravel substrates in the GOM, and with mud, sand, and gravelly sand in SNE. Ten minute squares that accounted for 90% of pot fishing activity in the mid-Atlantic did not represent more than 20% of any sediment type in the region. On GB, where even fewer trips were reported, no more than 12% of any sediment type was associated with 90% TMS.

1.3.4.4 Bottom Trawls

Bottom trawling in federal waters in the Northeast region during 1995-2001 accounted for more than twice as many days absent as scallop dredging and was represented in more than twice as much area (Figure 216). Significant areas were closed to bottom trawlers during the seven-year period (15% of GB and 5% in SNE). These areas account for the large gaps in the distribution of trawling activity on GB and SNE. Bottom trawling, more than any other gear type, was also conducted to a greater extent in deeper water in the GOM, north of GB, and along the shelf break in SNE and the mid-Atlantic. A continuous area of high trawling activity occurred from the central GOM west to the coast, then through the southwestern GOM, down the west side of the Great South Channel and east across the top of Closed Area I on GB. Trawling was also reported west and south of Closed Area II on eastern GB, on the southern portion of GB, throughout most of SNE in inner, mid, and outer shelf waters, along the shelf break in the mid-Atlantic, and in North Carolina coastal waters. There was a large area with no significant amount of trawling in the middle and inner portions of the mid-Atlantic shelf from the New York Bight south to the North Carolina border.

Analysis of VTR data by region showed that trawling activity was fairly evenly distributed among the four regions of the Northeast shelf (Figure 216). The GOM and GB regions, however, ranked somewhat higher than SNE and the mid-Atlantic in most cases. In terms of the area included in TMS that accounted for 90% of the reported number of days absent from port, a larger proportion of the SNE region was trawled than was trawled in any of the other regions and the mid-Atlantic region the least affected. Trawling was distributed over a high proportion of total area in all regions except the mid-Atlantic where it was no more extensive than scallop dredging and only slightly more extensive than hydraulic clam dredging.

Bottom trawling was widely distributed on a variety of substrates in the NE region, but appeared to be more widespread on mud bottom in the GOM and on sand and gravel in the other three regions where coarser substrates are more common (Figure 217). Analysis of VTR data according to sediment type indicated that bottom trawling was less common on sandy substrates in the NE region than dredging and more common on mud and muddy sand than the other two mobile gear types (Figure 218). In terms of the total amount of each sediment type present in the NE region, trawling was distributed over a much higher percentage of mud and muddy sand bottom than dredges and also ranked higher than dredges on sand and gravel and about the same as scallop dredges on gravelly sand. Trawling activity was extensively distributed over all five sediment types in the GOM, GB, and SNE regions (Figure 217). In the mid-Atlantic region, a much smaller proportion of sand and gravelly sand was trawled and no trawling was reported in the very small amount of gravel present in this region.

Otter trawls are used in the mid-Atlantic to harvest scallops. The primary fishing ground (not shown) is located along the shelf break between 37° and 40° N latitude on sandy bottom. They are also used to harvest pandalid shrimp in the Gulf of Maine and penaeid shrimp in North Carolina. Shrimp trawling takes place mostly in coastal and estuarine waters.

1.3.4.5 Scallop Dredges

Scallop dredging in federal waters in the Northeast region during 1995-2001 accounted for less than half as many days absent as bottom trawling, but nearly ten times more time at sea than was spent dredging with hydraulic clam dredges (Figure 216). Portions of the three areas on GB that were closed in 1995 to all bottom-tending gears capable of catching groundfish (including scallop dredges) were opened to scallop dredges in 1999 and 2000. (These areas were therefore included in the spatial calculations of scallop dredging activity for the whole time period). Scallop dredging during 1995-2001 was reported in TMS along the eastern Maine coast, in the extreme southwestern "corner" of the GOM north of Cape Cod, along the western side of the Great South Channel, along the northern edge of GB and on its southeastern flank, and in a very large continuous area reaching from the eastern end of Long Island south across the shelf and in outer shelf waters as far south as the North Carolina border (Figure 211). Large expanses of bottom area in the outer GOM, on the top of GB, in SNE, and in inner shelf waters of the mid-Atlantic did not support any scallop dredging at the 50-90% activity levels. Unlike bottom trawling, scallop dredging was almost completely confined to depths shallower than 50 fathoms. Analysis of VTR data by sub-region showed that about half of the reported scallop dredging days at sea were in the MA region, about 30% in the GB region (the same proportion as for trawls), 10% in SNE, and 5% or less in the GOM (Figure 216). Expressed as a percentage of the total area included within the 90% TMS in each region, the MA region again ranked first, followed by GB, SNE, and the GOM, as before.

Scallop dredging was confined mostly to sandy substrates in the mid-Atlantic region, was common on sand, gravel, and gravelly sand on GB, and (apparently) on mud and sand bottom areas in the GOM (Figure 216 and Figure 217). Large areas of sand in shallower water on GB, and sand, muddy sand, and mud in SNE were not dredged during 1995-2001. Throughout the NE region, scallop dredging was reported for TMS that included a high proportion of sand and very low proportions of any other sediment type (Figure 218). In the two sub-regions where most scallop dredging occurred (GB and mid-Atlantic), fishing was increasingly more common on coarser substrates (Figure 217). The same trend was observed for the entire Northeast region (Figure 216). In the GOM, a very low percentage of mud in the entire region was dredged; sand ranked the highest, with intermediate values for muddy sand, gravelly sand and gravel. In SNE, only sand and gravelly sand supported any significant amount of scallop dredging.

1.3.4.6 Hydraulic Clam Dredges

Fishing activity by hydraulic clam dredge vessels was compiled as time spent fishing and so could not be directly compared with time at sea for scallop dredge and bottom trawl vessels. Nevertheless, clam dredging activity was clearly less intensive during 1995-2001 than for either of the other two major types of mobile gear (Figure 216). The area represented by TMS that accounted for 90% of the total clam dredging activity was about half the area where most scallop dredging was reported and one-fourth the area where most bottom trawling was reported. Hydraulic dredging accounted for a higher percentage of days fished and area in the mid-Atlantic region than in SNE. Hydraulic dredges were used in a larger percentage of SNE than scallop dredges, and a smaller percentage of the mid-Atlantic. Hydraulic clam dredging took place in SNE and the mid-Atlantic, generally in shallower shelf waters than scallop dredging and trawling. A cluster of TMS off the New Jersey coast was heavily fished, as were other TMS further out toward the edge of the shelf, south of Long Island, and in SNE waters (Figure 212). Clam dredges do not operate on GB because ocean quahogs on the bank contain red tide-causing micro-organisms and can not be harvested. Hydraulic clam dredging is restricted to sandy and muddy sand substrates because the gear can be damaged in hard bottom areas (NREFHSC 2002). For this reason, hydraulic dredges are not used in the GOM.

Like the other two mobile gears, hydraulic dredges were used primarily on sandy bottom in the NE region (Figure 218). Relative to the amount of each sediment type available in the NE region, hydraulic dredges were used more on sand and gravelly sand than on gravel and muddy sand. Sand and gravelly sand were more extensively dredged than muddy sand in SNE and gravel and gravelly sand more extensively than sand and muddy sand in the MA region (Figure 217).

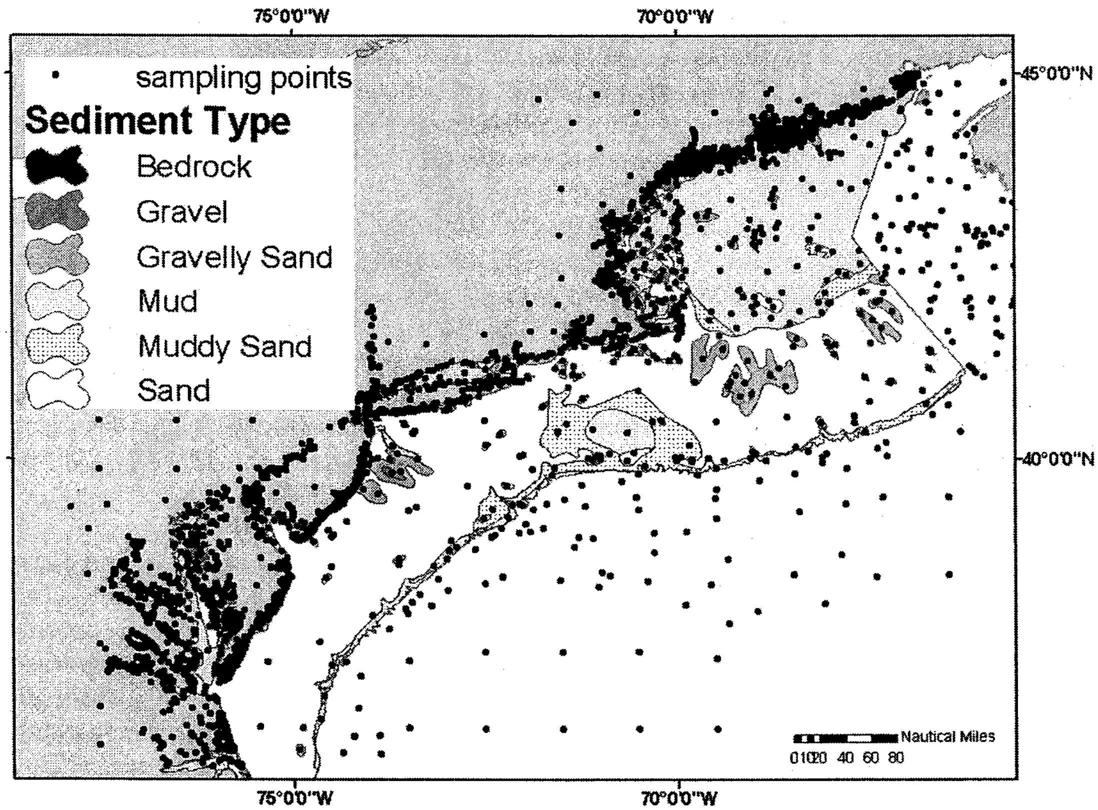


Figure 1 - Distribution of surficial sediments and sampling locations in the U.S. Northeast region (modified from Poppe *et al.* 1986)

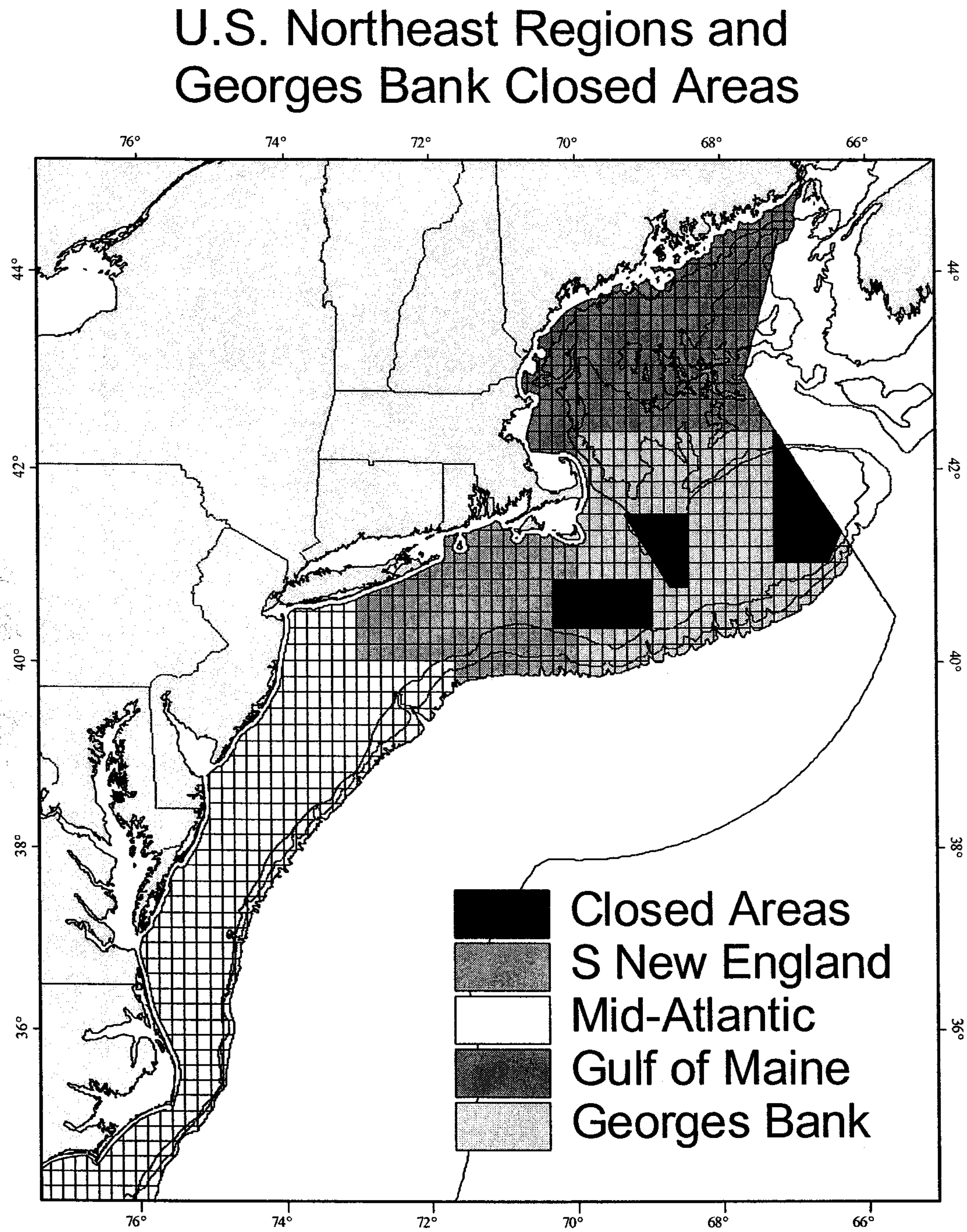


Figure 2 – Sub-regions of the U.S. Northeast shelf and areas on Georges Bank closed to bottom trawling since 1995

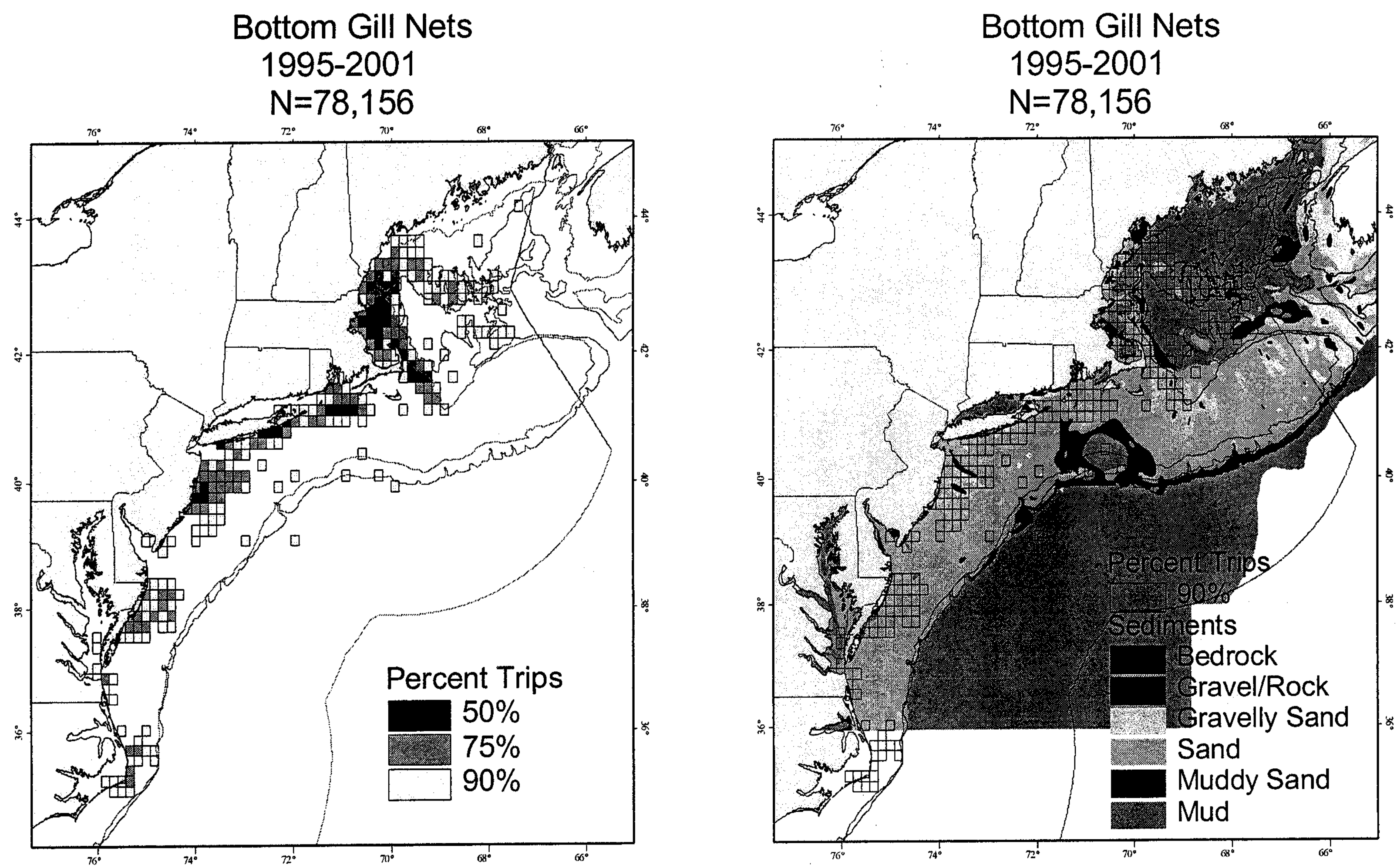


Figure 3 - Spatial distribution of ten minute squares (TMS) that account for high (50%), medium (75%), and low (90%) levels of fishing activity by bottom gill nets in the U.S. Northeast region and overlays of 90% TMS on sediments.

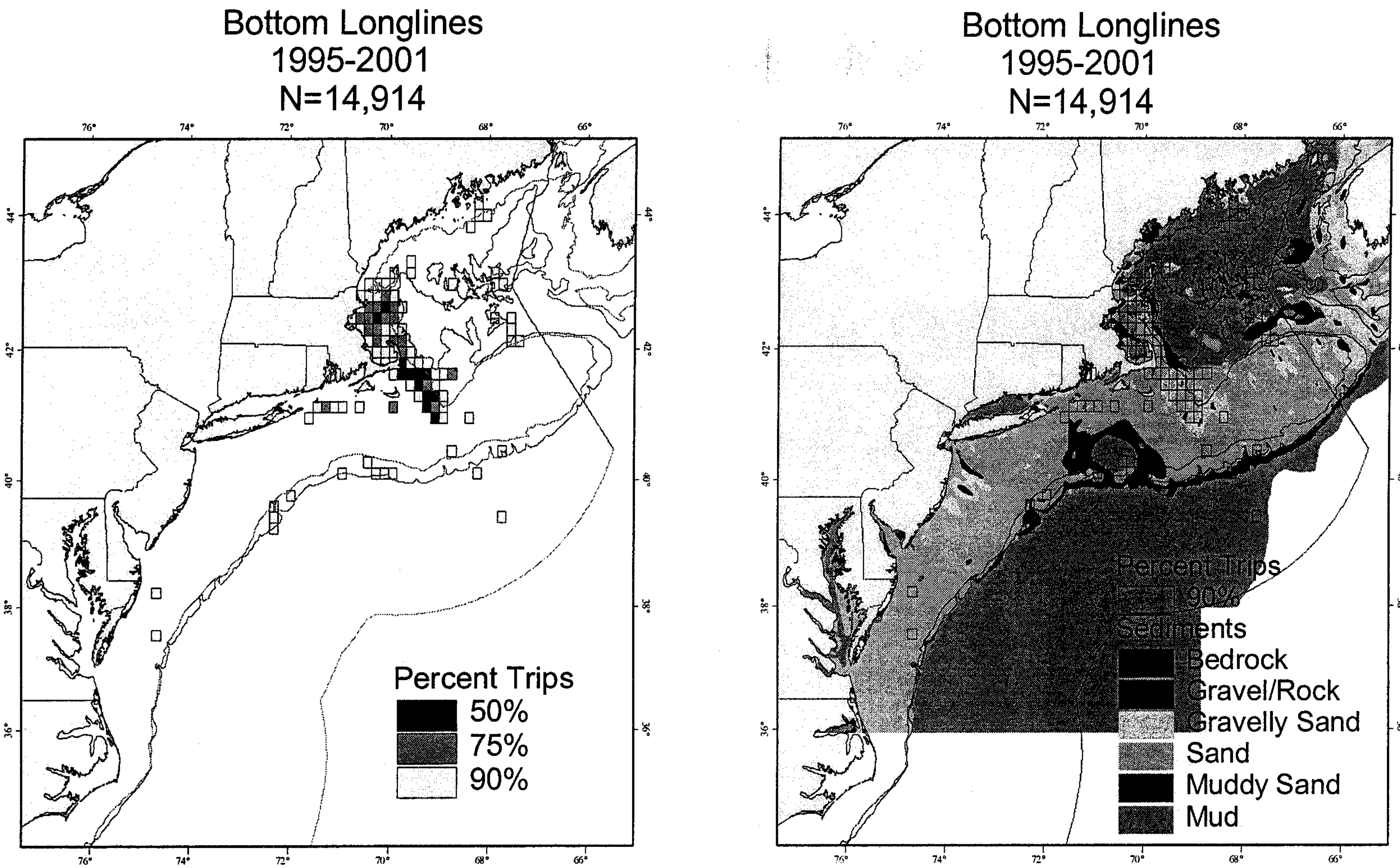
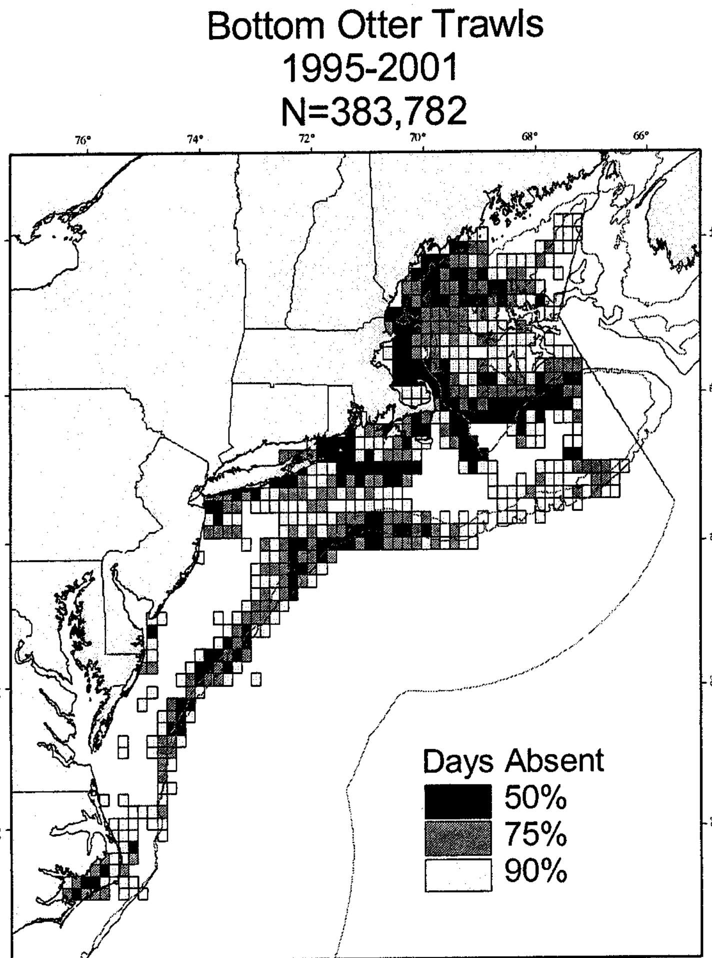


Figure 4 - Spatial distribution of ten minute squares (TMS) that account for high (50%), medium (75%), and low (90%) levels of fishing activity by bottom longlines in the U.S. Northeast region and overlays of 90% TMS on sediments.



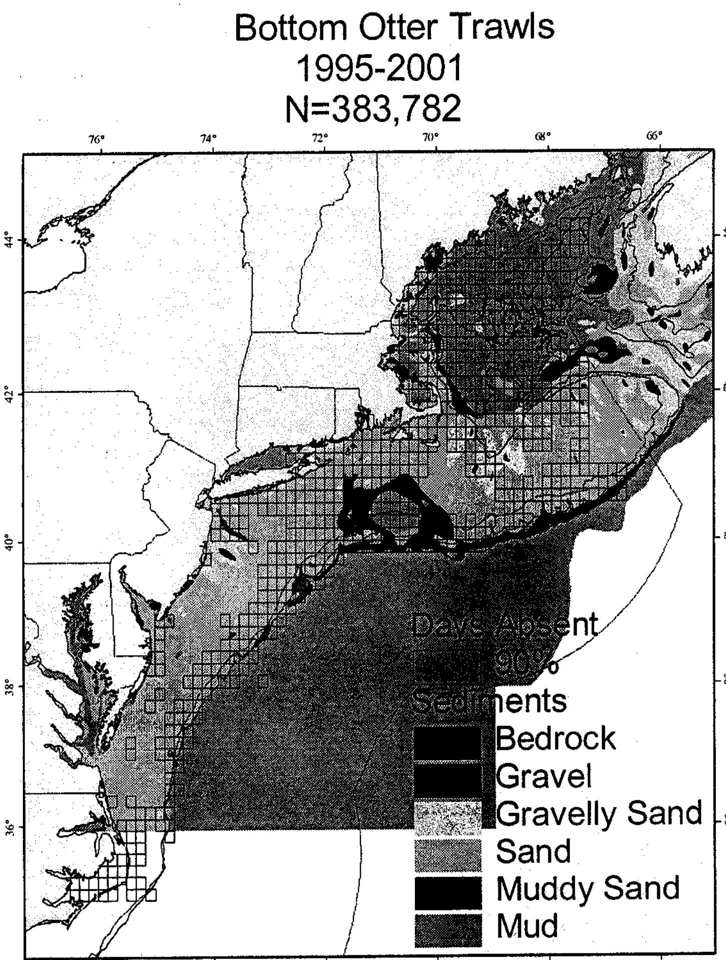
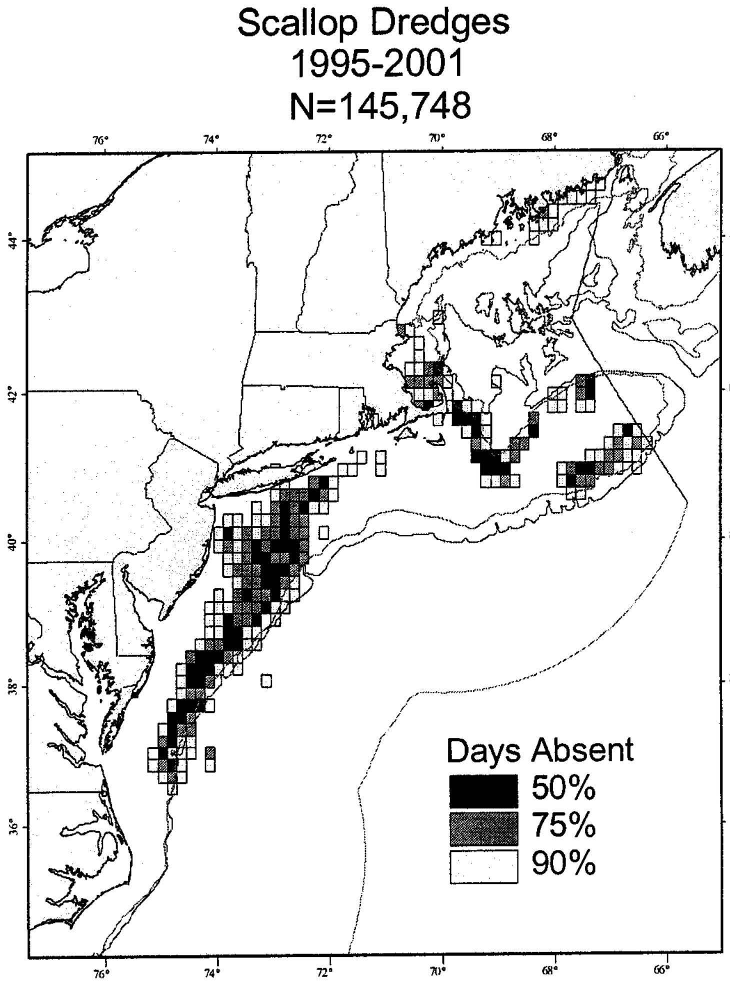


Figure 5 - Spatial distribution of ten minute squares (TMS) that account for high (50%), medium (75%), and low (90%) levels of fishing activity by bottom otter trawls in the U.S. Northeast region and overlays of 90% TMS on sediments.



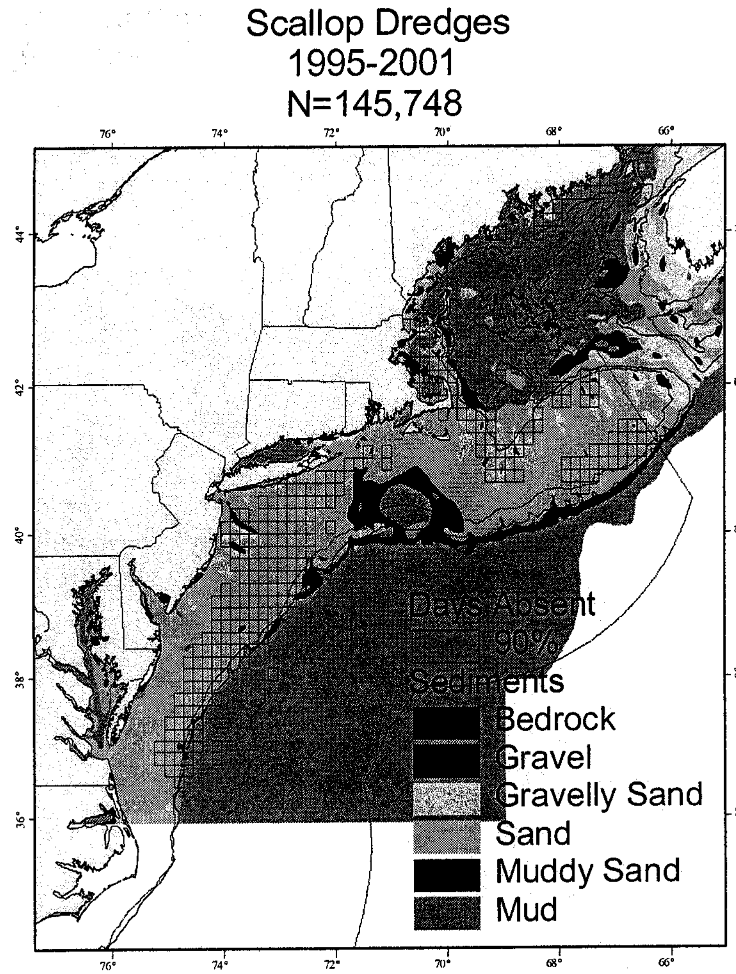


Figure 6 - Spatial distribution of ten minute squares (TMS) that account for high (50%), medium (75%), and low (90%) levels of fishing activity by scallop dredges in the U.S. Northeast region and overlays of 90% TMS on sediments.

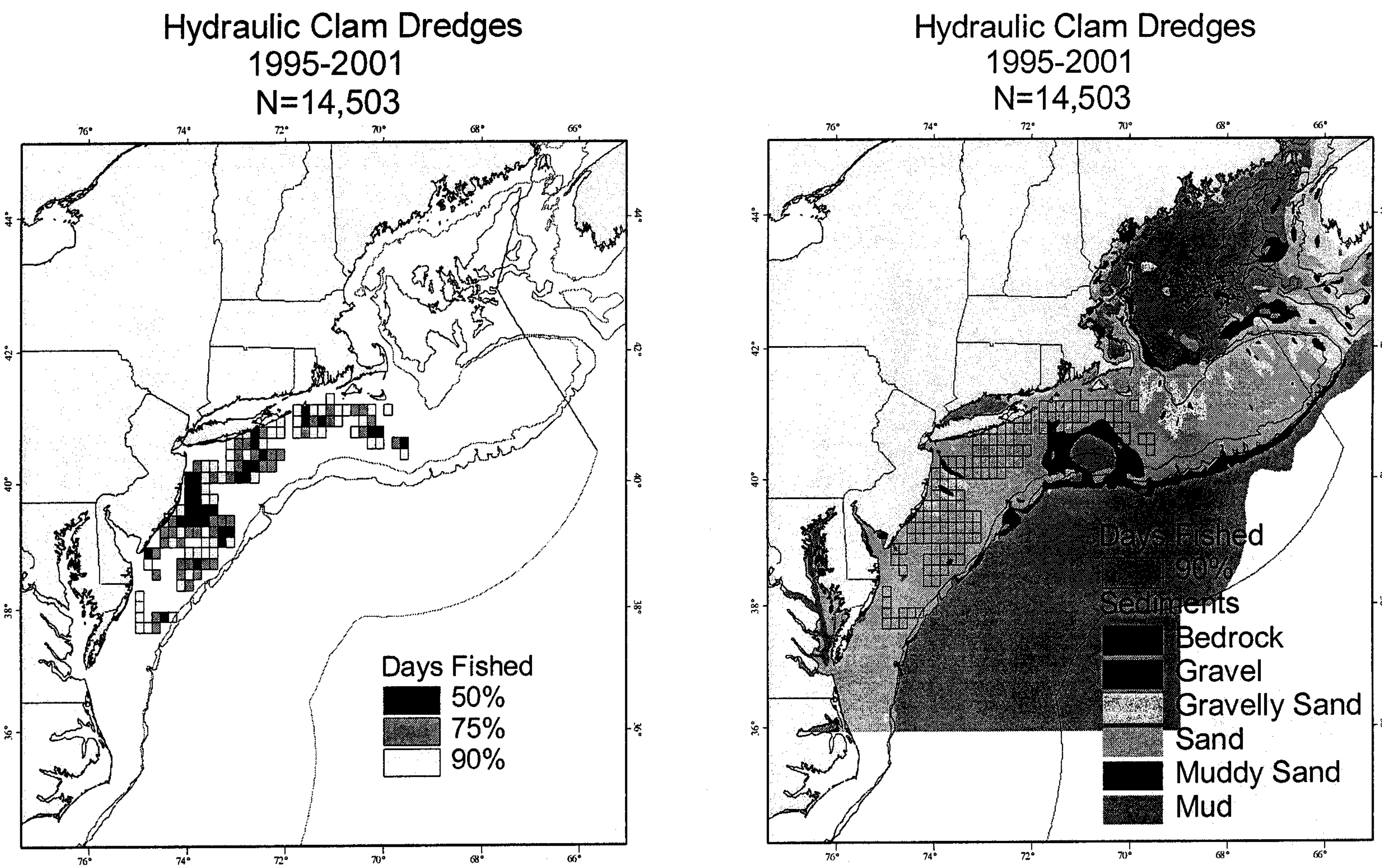
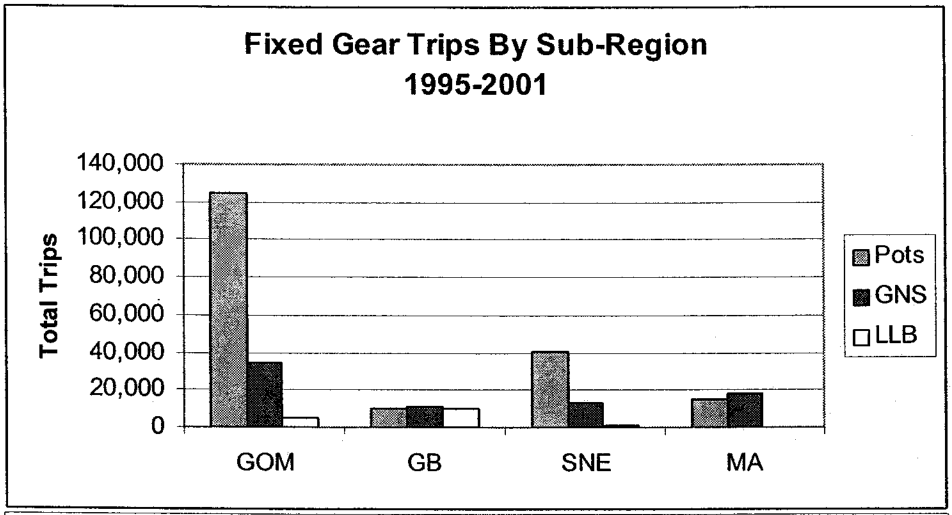
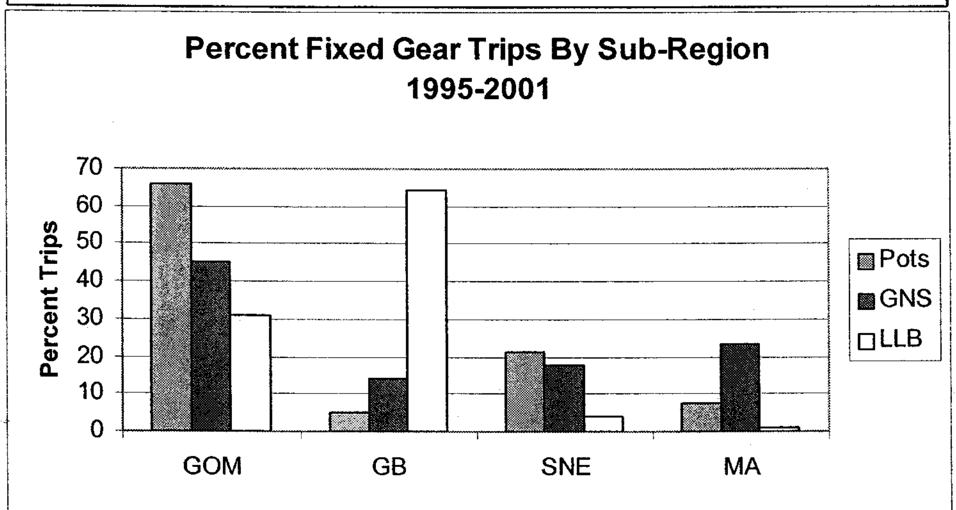


Figure 7 - Spatial distribution of ten minute squares (TMS) that account for high (50%), medium (75%), and low (90%) levels of fishing activity by hydraulic clam dredges in the U.S. Northeast region and overlays of 90% TMS on sediments.





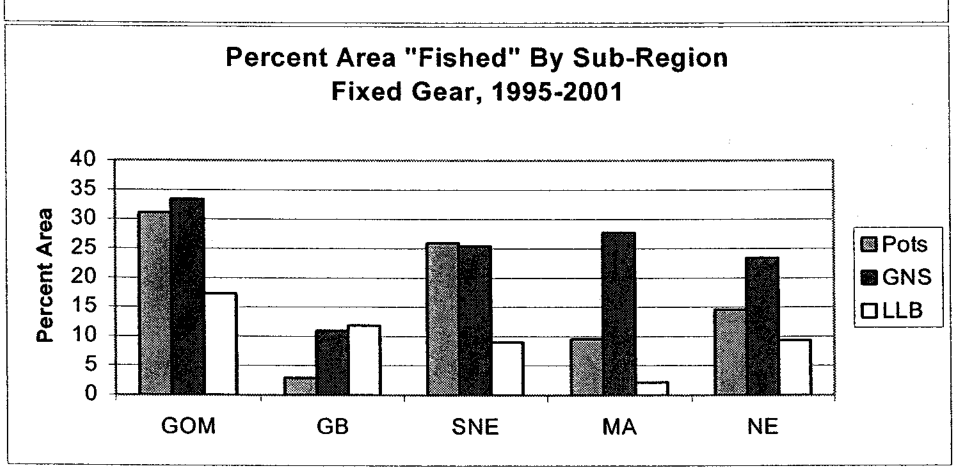


Figure 8 - Total and percent trips for the three principal fixed gear types used in the Northeast region by sub-region (top two graphs) and percent of total area in each sub-region and in the entire NE region occupied by TMS that account for 90% of the total fishing activity by each gear type (bottom graph).

GOM = Gulf of Maine, GB = Georges Bank, SNE = southern New England, MA = Mid-Atlantic, Pots = all pots, GNS = bottom gill nets, and LLB = bottom longlines.

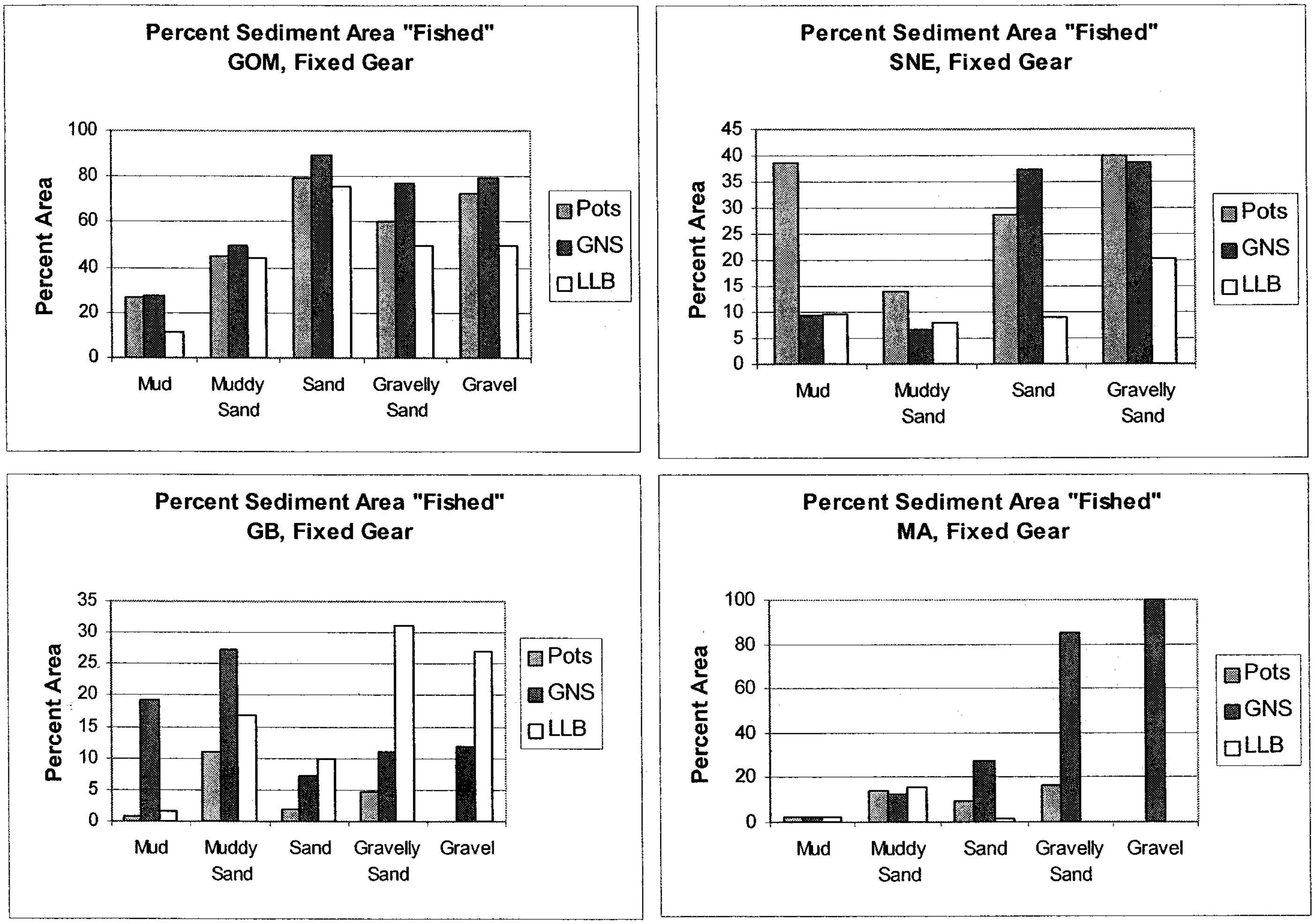
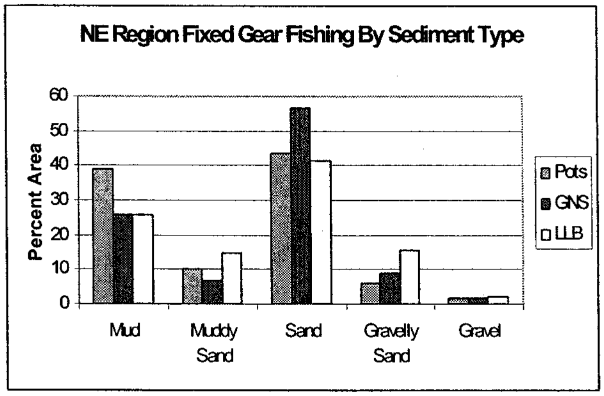


Figure 9 - Relative distribution of fishing activity by sediment type for vessels fishing with pots, bottom gill nets (GNS), and bottom longlines (LLB) as a percentage of the area occupied by TMS that accounted for 90% of the total number of trips in four sub-regions of the U.S. NE region.
GOM = Gulf of Maine, GB = Georges Bank, SNE = southern New England, and MA = Mid-Atlantic.
"Area fished" estimates are based on the area included in TMS that accounted for 90% of total fishing activity by bottom trawl (BT), scallop dredge (DRS), and hydraulic clam dredge (HYD) vessels.



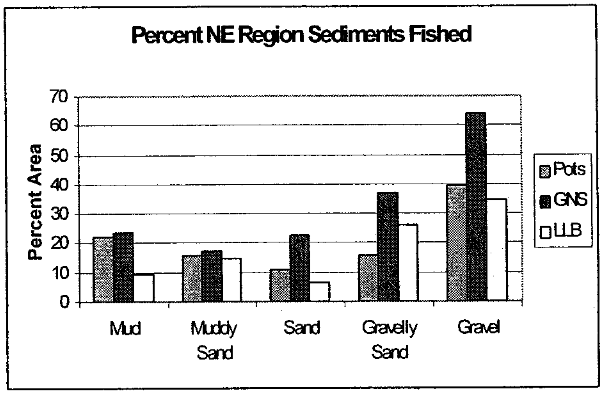
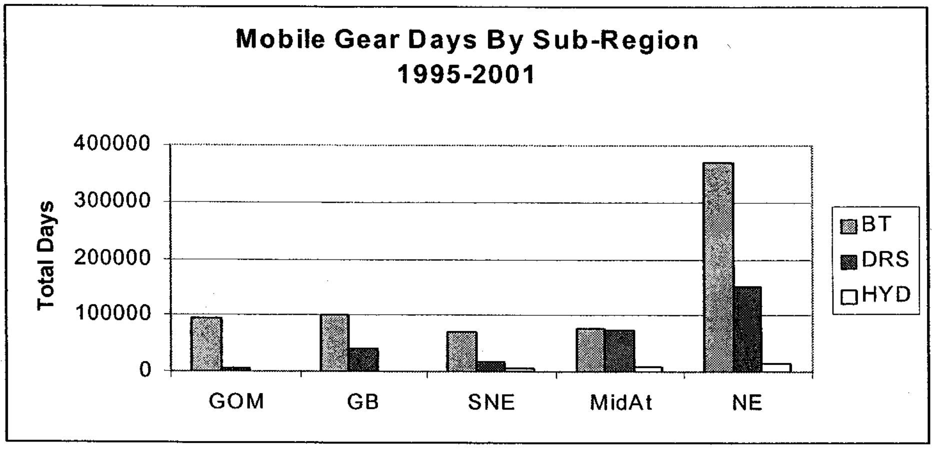
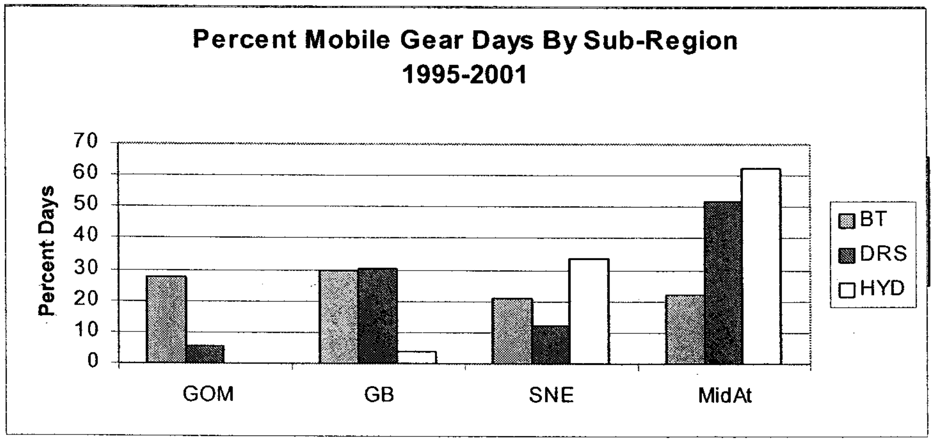


Figure 10 - Percent area by sediment type and percent area of each sediment type that was included in ten minute squares that accounted for 90% of total fishing activity by pots, bottom gill nets, and bottom longlines during 1995-2001 in the U.S. Northeast region.





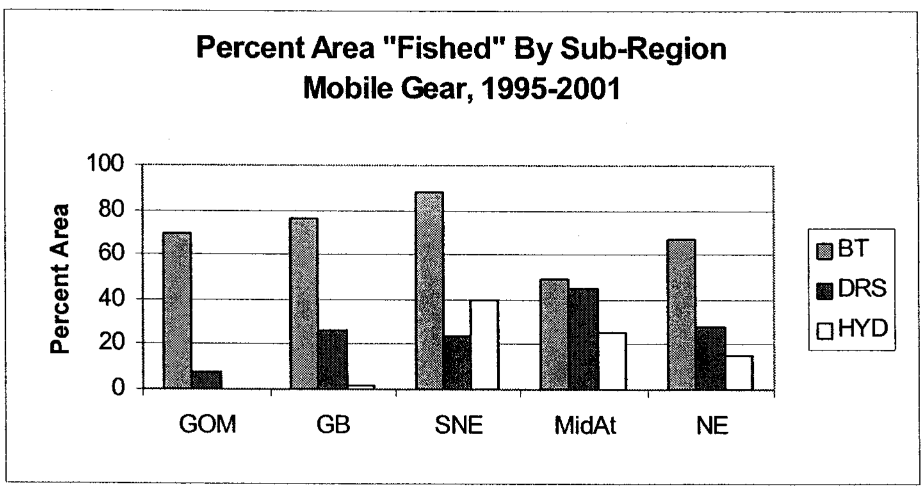


Figure 11 - Total and percent days absent from port or fishing for the three principal mobile gear types used in the Northeast region by sub-region (top two graphs) and percent of total area in each sub-region and in the entire NE region occupied by TMS that account for 90% of the total fishing activity by each gear type (bottom graph).
GOM = Gulf of Maine, GB = Georges Bank, SNE = southern New England, MA = Mid-Atlantic, BT = bottom trawls, DRS = scallop dredges, and HYD = hydraulic clam dredges.

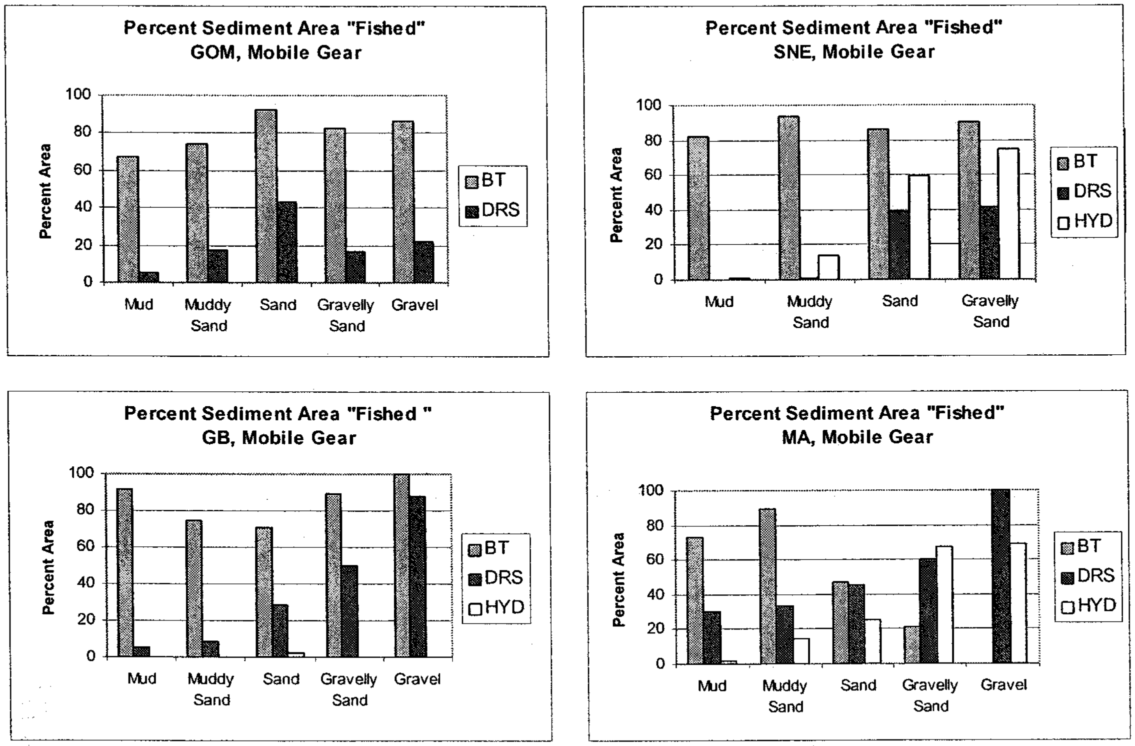
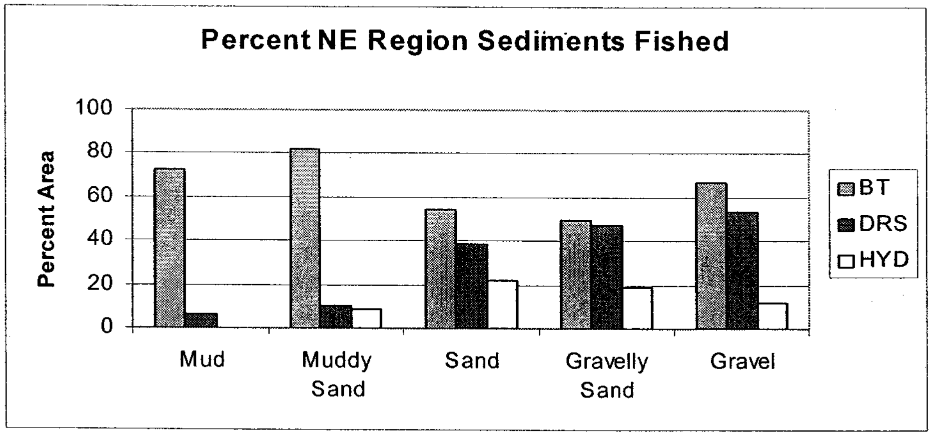


Figure 12 - Relative distribution of fishing activity by sediment type for bottom trawl (BT), scallop dredge (DRS), and hydraulic clam dredge (HYD) vessels as a percentage of the area occupied by TMS that accounted for 90% of the total number of days absent from port or days fishing in four sub-regions of the U.S. NE region.

GOM = Gulf of Maine, GB = Georges Bank, SNE = southern New England, and MA = Mid-Atlantic.



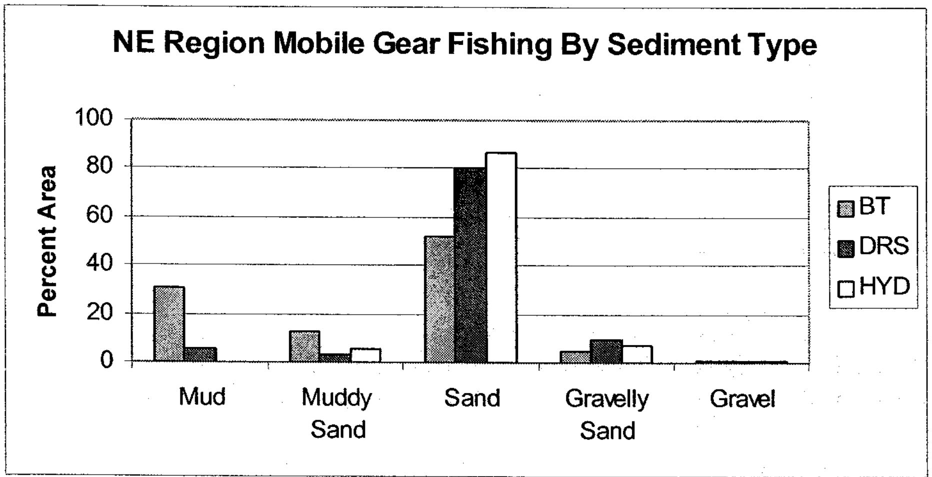


Figure 13 - Percent area by sediment type and percent area of each sediment type present that was included in ten minute squares that accounted for 90% of total fishing activity by bottom trawls, scallop dredges, and hydraulic clam dredges during 1995-2001 in the U.S. Northeast region.

1.4 Types of Gear Effects

1.4.1 Overview of Existing Information

A number of authors have reviewed, to varying extents, existing scientific literature on the effects of fishing on habitat (e.g., Auster et al. 1996, Cappo et al. 1998, Collie 1998, Jennings and Kaiser 1998, Rogers et al. 1998, Auster and Langton 1999, Hall 1999, Collie et al. 2000, Lindeboom and de Groot 2000, Barnette 2001, National Research Council 2002). The following summary of the conclusions reached by these authors is extracted from a recent NOAA report (Johnson 2002).

A number of review papers have focused specifically on the physical effects of bottom trawls. In Europe, an ICES working committee (ICES 1973) concluded that otter trawls, beam trawls and dredges all have similar effects on the seabed, but the magnitude of disturbance increases from shrimp to beam trawls with tickler and stone guards, to Rapido trawls, to mollusc (e.g., scallop) dredges. Kaiser et al. (1996) and Collie et al. (2000) state that, because beam trawls are used almost exclusively in areas that are adapted to frequent wave/tidal action, they are less likely to adversely affect bottom habitats. As mentioned elsewhere in this DEIS, scallop dredges used in Europe and Australia are designed differently than the sweep dredge used in the Northeast region of the U.S. Specifically, they have a row of teeth that penetrate several inches into the bottom and therefore have a greater impact on benthic habitats than the sweep dredge. Beam trawls and Rapido trawls are not used in the U.S. groundfish fishery.

Auster et al. (1996) conducted three studies of mobile fishing gear in the Gulf of Maine and concluded that mobile fishing gear alters the seafloor, and reduces habitat complexity, sedimentary structures, and emergent epifauna. Collie (1998) reviewed studies from New England and concluded that hard bottom benthic habitats (e.g., boulders and gravel pavement) experience significant impacts of mobile bottom-tending fishing gear, while mobile sand habitats are less vulnerable. Jennings and Kaiser (1998) concluded that fishing activities lead to changes in the structure of marine habitats and influence the diversity, composition, biomass, and productivity of the associated biota. They further concluded that these effects vary according to gears used, habitats fished, and the magnitude of natural disturbance, but tend to increase with depth and the stability of the substrate. Auster and Langton (1999) reviewed 22 studies from a wide geographic range and concluded that mobile fishing gear reduces habitat complexity by: (1) directly removing epifauna or damaging epifauna leading to mortality, (2) smoothing sedimentary bedforms and reducing bottom roughness, and (3) removing taxa which produce structure (i.e., taxa which produce burrows and pits). They also concluded that for fixed gear, the area impacted per unit effort is smaller than for mobile gear, but the types of damage to emergent benthos appear to be similar (but not necessarily equivalent per unit effort).

Collie et al. (2000) analyzed 39 published studies to compile and evaluate current findings regarding fishing gear effects on different types of benthic habitat. They found: (1) 89% of the studies were undertaken at depths less than 60 m; (2) otter trawl gear is the most frequently studied; (3) most studies have been done in Northern Europe and Eastern North America. The authors reached several conclusions regarding the effects of fishing: (1) intertidal dredging and scallop dredging have the greatest initial effects on benthic biota, followed by otter trawling and then beam trawling (although beam trawling studies were conducted in dynamic sandy areas, where effects might be less apparent); (2) fauna in stable gravel, mud and biogenic habitats are more adversely affected than those in less consolidated coarse sediments; (3) recovery appears most rapid in less physically stable habitats (inhabited generally by more opportunistic species); (4) we may accurately predict recovery rates for small-bodied taxa, but communities often contain one or two long-lived, vulnerable species; (5) large-bodied organisms are more prevalent before trawling; and (6) the mean initial response to fishing impacts is negative (55% reduction of individual taxa). Based on these findings, the authors suggested that the scientific community abandon short-term small-scale experiments and undertake larger scale experiments that mimic the timing and frequency of disturbance typical of commercial fishing activities.

A working committee of the International Council for the Exploration of the Seas (ICES) issued, in November 2000, a report on the "Effects of Different Types of Fisheries on North Sea and Irish Sea Benthic Ecosystems." This report (ICES 2000) was a summary of findings based on a comprehensive report of the same title edited by Lindeboom and de Groot (1998). The ICES report identified a number of possible effects of beam trawls and bottom otter trawls on benthic habitats and species. Two general conclusions were: 1) low-energy environments are more affected by bottom trawling; and 2) bottom trawling can affect the potential for habitat recovery (i.e., after trawling ceases, benthic communities and habitats may not always return to their original pre-impacted state). Regarding direct habitat effects, the committee concluded that:

1. <u>Bottom trawls can cause the loss or dispersal of physical features</u> such as peat banks or boulder reefs. These changes are always permanent and lead to an overall change in habitat diversity. This, in turn, can lead to the local loss of species and species assemblages dependant on such features.

2. <u>Bottom trawling can cause the loss of structure-forming organisms</u> (e.g., colonial bryozoans, Sabellaria, hydroids, seapens, sponges, mussel beds, and oyster beds). These changes may be permanent and can lead to an overall change in habitat diversity. This, in turn, can lead to the local loss of species and species assemblages dependant on such biogenic structures.

3. <u>Bottom trawling can cause a reduction in complexity</u> by redistributing and mixing surface sediments as well as degrading habitat and biogenic features. This can lead to a decrease in the physical patchiness of the sea floor. These changes are not likely to be permanent.

4. <u>Bottom trawling can alter the detailed physical structure of the sea floor</u> by reshaping seabed features such as sand ripples and damaging burrows and associated structures. These features provide important habitats for smaller animals and can be used by fish to reduce their energy requirements. These changes are not likely to be permanent.

The committee also identified a number of possible effects of bottom trawling on species.

- Bottom trawling can cause the loss of species from part of their normal range.
- Bottom trawling can cause a decrease in populations which have low rates of turnover.
- The relative abundance of species is altered by bottom trawling.
- Fragile species are more affected by bottom trawling than robust species
- Surface-living species are more affected by bottom trawling than deep-burrowing species.
- Bottom trawling can have sub-lethal effects on individuals.
- Bottom trawling can cause an increase in populations which have high rates of turnover.
- Bottom trawling favors populations of scavenging species.

Direct habitat effects of fishing have also been summarized by Johnson (2002) in four categories: alteration of physical structure, sediment suspension, chemical modifications, and benthic community changes. Most of the effects mentioned below can also be found in the review of the existing gear effects literature that is included in the Gear Effects Evaluation of this DSEIS.

1.4.2 Alteration of Physical Structure

Physical effects of fishing gear can include scraping, plowing, burial of mounds, smoothing of sand ripples, removal of stones or dragging and turning of boulders, removal of taxa that produce structure, and removal or shredding of submerged aquatic vegetation (Fonseca et al.1984, Messieh et al. 1991, Black and Parry 1994, Gordon et al. 1998, Kaiser et al. 1998, Lindeboom and de Groot 1998, Schwinghamer et al. 1998, Auster and Langton 1999, Kaiser et al. 1999, Ardizzone et al. 2000). These physical alterations reduce the heterogeneity of the sediment surface, alter the texture of the sediments, and reduce the structure available to biota as habitat. As mobile gear is dragged across the seafloor, parts of some gears can penetrate up to 5-30 cm into the substrate under usual fishing conditions, and likely to greater depths under unusual conditions (Drew and Larsen 1994). This action can leave tracks or even trenches in the seafloor, depending on the sediment type. It is unknown whether or to what extent these human-made features might compensate for the sediment smoothing actions of the gear.

Re-suspension of sediments occurs as fishing gear is dragged along the seafloor. Effects of sediment suspension can include reduction of light available for photosynthetic organisms, burial of benthic biota, smothering of spawning areas, and negative effects on feeding and metabolic rates of organisms. If re-suspension occurs over a large enough area it can actually cause large scale re-distribution of sediments (Messieh et al. 1991, Black and Parry 1994). Re-suspension may also have important implications for nutrient budgets due to burial of fresh organic matter and exposure of deep anaerobic sediment, upward flux of dissolved nutrients in porewater, and change in metabolism of benthic infauna (Mayer et al. 1991, Pilskaln et al. 1998).

Effects of sediment re-suspension are site-specific and depend on sediment grain size and type, water depth, hydrological conditions, faunal influences, and water mass size and configuration (Hayes et al. 1984, LaSalle 1990, Barnes et al. 1991, Coen 1995). Effects are likely more significant in waters that are normally clear compared with areas that are already highly perturbed by physical forces (Kaiser 2000). Schoellhamer (1996) concluded that re-suspension by natural mechanisms in a shallow estuary in west-central Florida was less frequent and of smaller magnitude than anthropogenic mechanisms (e.g., fishing) and that sediments disturbed by fishing were more susceptible to re-suspension by tidal currents. Modeling by Churchill (1989) revealed that re-suspension by trawling is the primary source of suspended sediment over the outer continental shelf of the eastern U.S., where storm-related stresses are weak. In the Kattegat Sea (Sweden), sandy sediments above the halocline were more affected by wind-induced impacts than by fishing, but mud sediments below the halocline experienced an increase in frequency of 90% in the spring and summer and of 75-85% in the autumn and winter due to fishing (Floderus and Pihl 1990). Thus, even when recovery times are fast, persistent disturbance by fishing could lead to cumulative impacts. In contrast, Dyekjaer et al. (1995) found that in Denmark, although local effects of short duration might occur, annual release of suspended particles by mobile fishing gear is relatively unimportant compared with that resulting from wind and land runoff.

Chronic suspension of sediments and resulting turbidity can also affect aquatic organisms through behavioral, sublethal and lethal effects, depending on exposure. Species reaction to turbidity depends on life history characteristics of the species. Mobile organisms can move out of the affected area and quickly return once the disturbance dissipates (Simenstad 1990, Coen 1995). Even if species experience high mortality within the affected area, species with short life history stages and high levels of recruitment or high mobility can repopulate the affected area quickly. However, if effects are protracted and occur over a large area, recovery through recruitment or immigration will be hampered. Furthermore, chronic re-suspension of sediments may lead to shifts in species composition by favoring those species that are better suited to recover or those that can take advantage of the pulsed nutrient supply as nutrients are released from the seafloor to the euphotic zone (Churchill 1989).

1.4.3 Changes in Chemistry

Fishing can produce changes to the chemical makeup of both the sediments and overlying water mass through mixing of subsurface sediments and porewater. In shallow water this mixing might be insignificant in relation to that produced by tidal and storm surge and wave action, but in deeper, more stable waters, this mixing can have significant effects (Rumohr 1998). In a shallow, eutrophic sound in the North Sea, fishing caused an increase in average ammonia content (although horizontal variations prevented interpretations of these increases) and a decrease in oxygen due to the mixing of reduced particles from within the sediments (Riemann and Hoffman 1991). Also in the North Sea, fishing enhances the phosphate released from sediment by 70-380 metric tons per year for otter trawls and by 10,000-70,000 metric tons per year for beam trawlers (ICES 1992). These pulses are partially compensated by lower fluxes after the trawl passes. It is important to remember that these releases recycle existing nutrients, rather than adding new nutrients, such as nutrients derived from rivers and land runoff (ICES 1992). During seasons when nutrients are low, mixing of the sediments could cause increased primary production and/or eutrophication.

1.4.4 Changes to Benthic Communities

Benthic communities are affected by fishing gear through damage to the benthos in the path of the gear and disturbance of the seafloor to a depth of up to 30 cm. Many kinds of epibenthic animals are crushed or buried, while infauna is excavated and exposed on the seabed. This is in addition to smothering addressed above.

Specific impacts from fishing depend on the life history, ecology and physical characteristics of the biota present (Bergman and Van Santbrink 2000). Mobile species that exhibit high fecundities and rapid generation times will recover more quickly than non-mobile, slow-growing organisms. In Mission Bay, California, polychaetes with reduced larval phases and postlarval movements had small-scale dispersal abilities that permitted rapid re-colonization of disturbed patches that maintained high infaunal densities (Levin 1984). Those with long-lived larvae were only available for successful re-colonization if the timing of disturbance coincided with periods of peak larval abundance; however, these species were able to colonize over much larger distances. Rijnsdorp and Van Leeuwen (1996) found that increased growth in the smallest size classes of plaice in the North Sea correlated to eutrophication and seabed disturbance caused by beam trawls. The authors hypothesized that trawling caused a shift in the benthic community from low-productive, long-lived species to high-productive, short-lived species that benefited from increased nutrient availability. This potentially could have led to increased prey availability, and thus, higher growth rates for the juvenile plaice.

The physical structure of biota also affects their ability to sustain and recover from physical impacts with fishing gear. Thin shelled bivalves and starfish show higher damage than solid-shelled bivalves in fished areas (Rumohr and Krost 1991). Animals that are able to retract below the surface of the seafloor or live below the penetration depth of the fishing gear will sustain much less damage than epibenthic organisms that inhabit the sediment surface. Animals that are more elastic and can bend upon contact with fishing gear will suffer much less damage than those that are hard and inflexible (Eno et al. 2001). Kaiser et al. (2000) found that chronic fishing around the Isle of Man, in the Irish Sea, has removed large-bodied fauna such that benthic communities are now dominated by smaller-bodied organisms that are less susceptible to physical disturbance. Off the northwest shelf of Australia, a switch of dominant fish species from lethrinids and lutjanids (which are almost exclusively associated with habitats supporting large epibenthos) to saurids and nemipterids (which were found on open sand) occurred after removal of epibenthic fauna by trawling (Sainsbury et al. 1993, 1994) has been documented.

Increased fishing pressure can also lead to changes in distribution of species, either through movement of animals away from or towards the fished area (Kaiser and Spencer 1993, 1996, Ramsay et al. 1996, Kaiser and Ramsay 1997, Ramsay et al. 1998, Bradshaw et al. 2000, Demestre et al. 2000). Frid and Hall (1999) found higher prevalence of fish remains and scavengers and a lower abundance of sedentary polychaetes in stomach contents of dabs in the North Sea in areas of higher fishing effort. Kaiser and Spencer (1994) document that gurnards and whiting aggregate over beam trawl tracks and have higher numbers of prey items in their stomachs shortly after trawling. Based on these studies, researchers have speculated that mobile fishing may lead to increased populations of species that exhibit opportunistic feeding behavior. Fonds and Groenewold (2000) modeled results for the southern North Sea indicating that the annual amount of food supplied by beam trawling is approximately 7% of the food demand of common benthic predators. This level could help maintain populations but is insufficient to support further population growth.

The most recent and comprehensive summary of gear effects on benthic marine habitats was prepared by the National Research Council. This report, entitled "Effects of Trawling and Dredging on Seafloor Habitat" (NRC 2002) reiterated four general conclusions regarding the types of habitat modifications caused by trawls and dredges.

- Trawling and dredging reduce habitat complexity.
- Repeated trawling and dredging result in discernable changes in benthic communities.
- Bottom trawling reduces the productivity of benthic habitats.
- Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance.

The NRC report also summarized the indirect effects of mobile gear fishing on marine ecosystems. It did not consider the effects of all gear types, only the two (trawls and dredges) that are considered to most affect benthic habitats. It also provided detailed information from only a few individual studies.
An additional source of information used in this DEIS is the report of a gear effects workshop sponsored by the New England and Mid-Atlantic Fishery Management Councils in October 2001 (NREFHSC 2002). This report includes conclusions reached by a panel of experts on the effect of different gears on benthic habitat types in the Northeast U.S. and is appended to this document (Appendix IV). Refer to the following tables in that report for conclusions on these gear types: Clam Dredges, Scallop Dredges, Otter Trawls, Pots and Traps, and Sink Gill Nets and Bottom Longlines. The results of the workshop have been considered in the next section, which includes a review of the relevant fishing gear effects literature.

1.4.5 Review of Fishing Gear Effects Literature Relevant to the U.S. Northeast Region

Forty-four publications were reviewed for this document. They included all known studies (written in English) that examined the effects of the three principal mobile, bottom-tending fishing gears used in the Northeast U.S. on benthic marine habitats. Only publications that evaluated the direct habitat effects of fishing by these gears were reviewed (i.e., modifications to the physical structure of the seafloor or effects on benthic organisms that live in or on the seafloor). Effects of fishing on resource populations were not included, nor were studies that evaluated the indirect effects of fishing on marine ecosystems caused by the selective removal of species targeted by the gear or which are caught incidentally (as by-catch) during fishing.

Both peer-reviewed and non-peer-reviewed publications were included, but most were peer-reviewed. To be included, accounts of research projects had to be complete and describe methods and results. Abstracts and poster presentations were not included. The summaries in this document are, in all cases, based on primary source documents. Two bottom-tending mobile gear types that are widely used in other parts of the world, but not in the Northeast U.S. – beam trawls and toothed scallop dredges – were not included even though considerable research has been conducted on their habitat effects. Also excluded were studies done on the effects of other gear types used strictly in inshore state waters in habitats where sea scallops are not found (e.g., escalator dredges in submerged aquatic vegetation) and any research relating to fixed and pelagic gear effects. Fixed bottom gears used in the Northeast region (e.g., lobster pots, bottom longlines and gill nets) have minimal impacts on benthic habitats (Eno et al. 2001, NREFHSC 2002).

The review is organized by gear and substrate type. The four substrate types were mud, sand, gravel/rock, and mixed substrate for studies that were conducted in more than a single sediment type. Nine of the 44 studies that were reviewed included information for more than one gear type or for one gear type in more than one substrate or study area and were therefore summarized in more than a single gear/substrate category. Thirty of the 53 individual research accounts were for bottom otter trawls, six were for scallop dredges, and seven for hydraulic dredges. In addition, ten addressed the combined effects of more than one gear type and are referred to as "multiple gears." Twenty-four of the studies were done in sandy substrate, 11 in mud, 5 in gravel and rocky bottom, and 13 in mixed substrate. Geographically, 18 were conducted in the Northeast U.S. (North Carolina to Maine), 13 elsewhere in North America (U.S. and Canada), 16 in Europe and Scandinavia, and 6 in Australia and New Zealand.

Each gear/substrate category includes a table summarizing the main points of each study. These include the location, depth, sediment, results, recovery information, and methodological approach of each study. Results summarized in the tables include positive and negative results, e.g., increases and decreases in abundance of non-resource benthic organisms caused by fishing, as well as instances when there were no detectable effects of fishing. Blank cells in the recovery column indicate that the study was not designed to provide information on recovery times. Information in the last column includes the nature of the research (experimental or observational), whether or not the study area was being commercially fished at the time of the study, and how the experimental fishing was conducted (single or multiple tows, discrete or repeated disturbance events, and – if known – the average number of tows to which any given area of bottom was exposed).

Results are summarized for all the studies in each gear-substrate category. Each summary begins with an introductory paragraph that includes general information, such as:

- The number of studies that examined physical and biological effects;
- How many studies were done in different geographic areas and depth ranges;
- How many examined recovery of affected habitat features;
- The number of studies performed in areas that were closed to commercial fishing vs. areas that were commercially fished at the time of the study;
- How many involved single vs. multiple tows; and
- How many were conducted either during a single, discrete time period or during a more prolonged period of time that was intended to simulate actual commercial fishing activity.

Physical and biological effects for each gear-substrate category are then summarized in separate paragraphs. When necessary, biological effects are presented separately for single disturbance and repeated disturbance experimental studies, and for observational studies.

1.4.5.1 OTTER TRAWLS

1.4.5.1.1 Otter Trawls – Mud

Results of 11 studies are summarized (Table 331). All of them were conducted during the last 11 years, five in North America, four in Europe, and one in Australia. One was performed in an inter-tidal habitat, one in very deep water (250 m), and the rest in a depth range of 14-90 meters. Seven of them were experimental studies, three were observational, and one was both. Two examined physical effects, six of them assessed biological effects, and three studies examined physical and biological effects. One study evaluated geochemical sediment effects. In this habitat type, biological evaluations focused on infauna: all nine biological assessments examined infaunal organisms and four of them also included epifauna. Habitat recovery was monitored on five occasions. Two studies evaluated the long-term effects of commercial trawling, one by comparing benthic samples from a fishing ground with samples collected near a shipwreck, while another evaluated changes in macrofaunal abundance during periods of low, moderate, and high fishing effort during a 27-year time period. Four of the experimental studies were done in closed or previously un-trawled areas and three in commercially fished areas. One study examined the effects of a single tow and six involved multiple tows, five restricted trawling to a single event (e.g., one day) and two examined the cumulative effects of continuous disturbance.

Physical Effects

Note that citations are numbered and refer to the references listed in Table 5.

Trawl doors produce furrows up to 10 cm deep and berms 10-20 cm high on mud bottom. Evidence from four studies (2,3,7,9) indicates that there is a large variation in the duration of these features (2-18 months). There is also evidence that repeated tows increase bottom roughness (11), fine surface sediments are re-suspended and dispersed (7), and rollers compress sediment (2). A single pass of a trawl did not cause sediments to be turned over (7), but single and multiple tows smoothed surface features (4,7).

Biological Effects

Single disturbance experimental studies

Two single-event studies (2,9) were conducted in commercially trawled areas. Experimental trawling in intertidal mud habitat in the Bay of Fundy (Canada) disrupted diatom mats and reduced the abundance of nematodes in trawl door furrows, but recovery was complete after 1-3 months (2). There were no effects on infaunal polychaetes. In a sub-tidal mud habitat (30-40 m deep), benthic infauna were not affected (9). In two assessments performed in areas that had not been affected by mobile bottom gear for many years (4,10), effects were more severe. In both cases, total infaunal abundance and the abundance of individual polychaete and bivalve species declined immediately after trawling (4,10). In one of these studies (10), there were also immediate and significant reductions in the number of species and species diversity. Positive effects included reduced porosity, increased food value, and increased chlorophyll production in surface sediments. Most of these effects lasted less than 3.5 months. In the other (4), two tows removed 28% of the epifauna on mud and sand substrate and epifauna in all trawled quadrats showed signs of damage. These results were not reported separately for mud bottom.

Repeated disturbance experimental studies

Two studies of the effects of repeated trawling were conducted in areas that had been closed to fishing for six years and >25 years. In one (6), multiple tows were made weekly for a year and, in the other (11), monthly for 16 months. In one case, 61% of the benthic species sampled tended to be negatively affected, but significant reductions were only noted for brittlestars (6). In the other, repeated trawling had no significant effect on the numbers of infaunal individuals or biomass (11). In this study, the number of infaunal species increased by the end of the disturbance period. Some species (e.g., polychaetes) increased in abundance, while others (e.g., bivalves) decreased. Community structure was altered after five months of trawling and did not fully recover until 18 months after trawling ended.

Observational studies
An analysis of benthic sample data collected from a fishing ground over a 27-year period of high, medium, and low levels of fishing effort showed an increased abundance of organisms belonging to taxa that were expected to increase at higher disturbance levels, whereas those that were expected to decrease did not change in abundance (5). Results of another study indicated that a trawling ground had fewer benthic organisms and fewer species than an un-exploited site near a shipwreck (1). Trawling in deep water apparently dislodged infaunal polychaetes, causing them to be suspended in near-bottom water (8).

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Ball et al. 2000	Irish Sea	75 m	Sandy silt	Reduced infaunal and epifaunal richness, diversity, number of species and individuals in fishing ground compared to wreck site.		Experimental trawling in heavily fished prawn fishing ground, unfished area near a shipwreck used as control.
2	Brylinsky et al. 1994	Bay of Fundy, , Nova Scotia, Canada	Inter-tidal	Silt and coarse sand overlain with silty layer	Door tracks in sediment, rollers compressed sediment; S decrease in nematodes and benthic diatoms in door tracks, no effects on larger infaunal organisms (mostly polychaetes).	Furrows visible 2-7 months; nematodes recovered in 1-1.5 mos, diatoms in about 1-3 mos.	Four trawling experiments (repeated tows during a single day) at two locations in a trawled area, effects evaluated for 1.5-4 mos.
3	DeAlteris et al. 1999	Narragansett Bay, Rhode Island, USA	14 m	Mud	Doors produced tracks 5-10 cm deep and adjacent berm 10-20 cm high.	No changes in hand dug trenches for > 60 days.	Diver observations
4	Drabsch et al. 2001	Gulf of St. Vincent, South Australia	20 m	Fine silt	Trawl door tracks, smoothing of topographic features, S decrease in total infaunal abundance and one group of polychaetes, damaged epifauna.		Experimental trawling (2 tows per unit area in 1 day) in area with no trawling for 15 years (1 site), effects evaluated after 1 week.
5	Frid et al. 1999	NE England (North Sea)	80 m	Silt/clay	S increase in total number of individuals in taxa predicted to increase at high fishing effort and number of errant polychaetes, no effect		Related changes in benthic fauna in a heavily trawled location to low, high, and

					of increasing effort on total number of individuals expected to decrease, but S decline in sea urchins.		moderate fishing activity and changes in phytoplankton production over 27 yrs.
6	Hansson et al. 2000	Fjord on the west coast of Sweden	75-90 m	Clay	61% infaunal species negatively affected and S reductions in brittlestars during last 6 mos of disturbance period, S reductions in total biomass and number of individuals in trawled <u>and</u> control sites, abundance of polychaetes, amphipods and molluscs not affected.		Experimental trawling for 1 year (2 tows per wk, 24 tows per unit area) in area closed to fishing for 6 yrs (3 treatment and 3 control sites), effects evaluated during last 5 mos of experiment.
7	Mayer et al. 1991	Maine coast, USA	20 m	Mud	Dispersal of fine surface sediment, doors made furrows several cm deep, some planing of surface features, but no plowing of bottom or burial of surface sediments.		Experimental trawling (single tow), examined immediate effects on sediment composition and food value to sediment depth of 18 cm.
8	Pilskaln et al. 1998	Gulf of Maine (USA)	250 m	Mud	Greater abundance of suspended infaunal polychaetes in more heavily-trawled area.		Deployed sediment traps in fishing grounds 25-35 m above substrate.
9	Sanchez et al. 2000	Coast of Spain, Mediterra nean Sea	30-40 m	Mud	Door tracks in sediment, no change in number of infaunal individuals or taxa or abundance of individual taxa, no changes in community structure.	Door tracks still clearly visible after 150 hrs.	Experimental trawling in trawled area at 2 sites swept once and twice in a single day, effects evaluated after 24, 72, 102, and 150 hrs.
10	Sparks-McConkey & Watling 2001	Penobsco t Bay, Maine (USA)	60 m	Mud	S decline in porosity, increased food value, and increased chlorophyll production of surface sediments, S reductions in number of infaunal individuals and	All geochemica l sediment properties and all but one polychaete/ bivalve	Experimental trawling (4 tows in 1 day) in untrawled area, pre-trawl sampling of sediments and infauna for a

					species, species diversity, and abundances of 6 polychaete and bivalve species, S increase in nemerteans.	species recovered within 3.5 mos, nemerteans still more abundant after 5 mos.	year, recovery monitored for 5 mos.
11	Tuck et al. 1998	West coast of Scotland	30-35 m	Fine silt	Tracks in sediment, increased bottom roughness, no effect on sediment characteristics; S increase in number of infaunal species after 16 mos and during 18 mo recovery period, no change in biomass or number of individuals; S increase in polychaetes, decrease in bivalves; S alteration in community structure after 5 mos, S reduction in diversity during first 22 mos.	Door tracks still evident after 18 months, bottom roughness recovered after 6 mos; nearly complete recovery of infaunal community within 12 mos, complete after 18 mos	Experimental trawling for 1 day/mo (1.5 tows per unit area) for 16 mos in area closed to fishing for >25 years, recovery monitored after 6, 12, and 18 mos

Table 5 - Effects of Otter Trawls on Mud Substrate Habitat: Summary of Published Studies
S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.1.2 Otter Trawls – Sand

Results of 14 studies are summarized (Table 6). One of them was described in a 1980 publication, all the rest have been published since 1998. Six studies were conducted in North America (three in a single long-term experiment on the Grand Banks), four in Australia, and four in Europe. Ten are experimental studies. Eight of them were done in depths less than 60 m, one at 80 m, and four in depths greater than 100 m. Three studies examined the physical effects of trawling, ten were limited to biological effects, and one examined both. Five of the biological studies were restricted to epifauna, one only examined infauna, and five included epifauna and infauna. The only experiment that was designed to monitor recovery was the one on the Grand Banks, although surveys conducted in Australia documented changes in the abundance of benthic organisms five years after closed areas were established. Two studies compared benthic communities in trawled areas of sandy substrate with undisturbed areas near a shipwreck. Six studies were performed in commercially exploited areas, five in closed areas, two compared closed and open areas, and one was done in a test tank. All the experimental studies examined the effects of multiple tows (up to 6 per unit area of bottom) and observational studies in Australia assessed the effects of 1-4 tows on emergent epifauna. Trawling in four studies was limited to a single event (1 day to 1 week), whereas the Grand Banks experiment was designed to evaluate the immediate and cumulative effects of annual 5-day trawling events in a closed area over a three-year period.

Physical effects
A test tank experiment showed that trawl doors produce furrows in sandy bottom that are 2 cm deep, with a berm 5.5 cm high (7). In sandy substrate, trawls smoothed seafloor topographic features (4,14), re-suspended and dispersed finer surface sediment (7), but had no lasting effects on sediment composition

(14). Trawl door tracks lasted up to one year in deep water (14), but only for a few days in shallow water (3). Seafloor topography recovered within a year (14).

Biological effects

Single disturbance experimental studies

Two single-event studies (2,6) were conducted in commercially trawled areas. In one of these studies (2), otter trawling caused high mortalities of large sedentary and/or immobile epifaunal species. In the other (6), there were no effects on benthic community diversity. Neither of these studies investigated effects on total abundance or biomass. Two studies were performed in un-exploited areas. One study documented effects on attached epifauna. In one (11), single tows reduced the density of attached macrobenthos (>20 cm) by 15% and four tows by 50%. In the other (4), two tows removed 28% of the epifauna on mud and sand substrate and epifauna in all trawled quadrats showed signs of damage. These results were not reported separately for sand bottom. Total infaunal abundance was not affected, but the abundance of one family of polychaetes was reduced.

Repeated disturbance experimental studies

Intensive experimental trawling on the Grand Banks reduced the total abundance and biomass of epibenthic organisms and the biomass and average size of a number of epibenthic species (12). Significant reductions in total infaunal abundance and the abundance of 15 taxa (mostly polychaetes) were detected during only one of three years, and there were no effects on biomass or taxonomic diversity (9).

Observational studies

Changes in macrofaunal abundance in a lightly trawled location in the North Sea were not correlated with historical changes in fishing effort (5), but there were fewer benthic organisms and species in a trawling ground in the Irish Sea than in an un-exploited site near a shipwreck (1). In the other "shipwreck study," however, changes in infaunal community structure at increasing distances from the wreck were related to changes in sediment grain size and organic carbon content (8). The Alaska study (10) showed that epifauna attached to sand were less abundant inside a closed area, significantly so for sponges and anemones. A single tow in a closed area in Australia removed 89% of the large sponges in the trawl path (13).

No.	Referenc e	Location	Depth	Sediment	Effects	Recovery	Approach
1	Ball et al. 2000	Irish Sea	35 m	Muddy sand	Lower number of infaunal and epifaunal species and individuals, species diversity and richness compared to wreck site.		Experimental trawling in heavily fished prawn fishing ground, unfished area near a shipwreck used as control.
2	Bergman and Santbrink 2000	Southern North Sea (Dutch coast)	<30-50 m	Silty sand and sand	High (20-50%) mortalities for 6 sedentary and/or immobile megafaunal (>1 cm) species, <20% for 10 others, from a single pass of		Experimental trawling (1.5 tows per unit area) in commercially trawled area, effects assessed

					the trawl, S effects on 11 of 54 occasions.		after 24-48 hrs.
3	DeAlteris et al. 1999	Narragansett Bay, Rhode Island (USA)	7 m	Sand	No tracks.	Hand dug trenches not visible after 1-4 days.	Diver observations.
4	Drabsch et al. 2001	Gulf of St. Vincent, South Australia	20 m	Coarse sand with shells.	Trawl door tracks, smoothing of topographic features, removal of and damage to epifauna, no S effects on total infaunal abundance, S reduction in density for one family of polychaetes after 1 week.		Experimental trawling (2 tows per unit area) in area with no trawling for 15 years, effects assessed after 1 week (site 1) and 3 mos (site 2).
5	Frid et al. 1999	NE England (North Sea)	55 m	Sand	Total abundance of benthic macrofauna increased as phytoplankton abundance increased, no correlation with fishing effort.		Related changes in benthic fauna in a lightly trawled location to low, high, and moderate fishing activity and changes in phytoplankton production over 27 yrs.
6	Gibbs et al. 1980	Botany Bay, New South Wales, Australia	Shallow estuary	Sand with 0-30% silt/clay	Sediment plume, no consistent effects on benthic community diversity, very little disturbance of seafloor.		Sampling before, immediately after, and 6 mos after 1 week of experimental trawling in fished location, control area located 200 km away.
7	Gilkinson et al. 1998	Test tank to simulate Grand Banks of Newfoundland		Sand	Trawl door created 5.5 cm berm adjacent to 2 cm furrow, bivalves displaced.		Observed effects of commercial otter door model in test tank.

8	Hall et al. 1993	North Sea	80 m	Coarse sand	Abundance of infauna related to changes in sediment type and organic content, not distance from shipwreck.		Sampled infauna at increasing distance from a shipwreck (proxy for increasing fishing effort).
9	Kenchington et al. 2001	Grand Banks, Newfoundland	120-146 m	Fine to medium grain sand	S short-term reductions in total abundance and abundance of 15 infaunal taxa (mostly polychaetes) in only 1 of 3 years , no short-term effects on biomass or taxonomic diversity, no long-term effects.	Infaunal organisms that were reduced in abundance in 1994 had recovered a year later.	Experimental trawling (3-6 tows per unit area) in closed area 1, 2 and 3 years after closure, lightly exploited for >10 yrs, effects evaluated within several hrs or days after trawling and after one year.
10	McConnaughey et al. 2000	Eastern Bering Sea, Alaska	44-52 m	Sand with ripples	Reduced abundance (S for sponges and anemones), more patchy distribution, and S decrease in species diversity of sedentary epifauna, mixed responses of motile taxa and bivalves.		Compared abundance of epifauna caught in small-mesh trawl inside and outside an area closed to trawling for almost 40 years.
11	Moran & Stephenson 2000	Northwest Australia	50-55 m	Not given, presumed to be sand	Single tow reduced density of macrobenthos (>20 cm) by 15%, 4 tows by 50%.		Video surveys before and after 4 experimental trawling events (1 tow per unit area) at 2-day intervals in unexploited area.
12	Prena et al. 1999	Grand Banks, Newfoundland	120-146 m	Fine to medium grain sand	24% average decrease in epibenthic biomass, S reductions in total		Experimental trawling (3-6 tows per unit area) in closed area

					and mean individual epifaunal biomass and biomass of 5 of 9 dominant species, damage to echinoderms.		1, 2 and 3 years after closure, lightly exploited for >10 yrs.
13	Sainsbury 1997	Northwest Australia	< 200 m	Calcareou s sands	Decreased abundance of benthic organisms and fish associated with large epifauna, removal of attached epifauna (single tow removed 89% of sponges >15 cm).	Increased catch rates of fish associated with large epifauna and small (<25 cm) benthos within 5 yrs, recovery of large epifauna takes >5 yrs.	Compared historical survey data (before and after fishing started) to data collected in area that remained open to commercial trawlers and area closed for 5 years.
14	Schwingh amer et al. 1998	Grand Banks, Newfoundland	120-146 m	Fine and medium grain sand	Tracks in sediment, increased bottom roughness, sediment re-suspension and dispersal, smoothing of seafloor and removal of flocculated organic material, organisms and shells organized into linear features.	Tracks last up to 1 year, recovery of seafloor topograph y within 1 year.	Experimental trawling (3-6 tows per unit area) in closed area 1, 2 and 3 years after closure, lightly exploited for >10 yrs.

Table 6- Effects of Otter Trawls on Sand Substrate Habitat: Summary of Published Studies
S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.1.3 Otter Trawls – Gravel/Rocky Substrate

Three studies of otter trawl effects on gravel and rocky substrates are summarized in this report (Table 7). All three were conducted in North America. Two were done in glacially-affected areas in depths of about 100 to 300 meters using submersibles and the third was done in a shallow coastal area in the southeast U.S. One involved observations made in a gravel/boulder habitat in two different years before and after trawling affected the bottom. The other two were experimental studies of the effects of single trawl tows. One of these was done in a relatively un-exploited gravel habitat and the other on a smooth rock substrate in an area not affected by trawling. Two studies examined effects to the seafloor and on attached epifauna and one only examined effects on epifauna. There were no assessments of effects on infauna. Recovery was evaluated in one case for a year.

Physical effects
Trawling displaced boulders and removed mud covering boulders and rocks (1) and rubber tire ground gear left furrows 1-8 cm deep in less compact gravel sediment (2).

Biological effects
Trawling in gravel and rocky substrate reduced the abundance of attached benthic organisms (e.g., sponges, anemones, and soft corals) and their associated epifauna (1,2,3) and damaged sponges, soft corals, and brittle stars (2,3). Sponges were more severely damaged by a single pass of a trawl than soft corals, but 12 months after trawling all affected species – including one species of stony coral – had fully recovered to their original abundance and there were no signs of damage (3).

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Auster et al. 1996	Gulf of Maine (Jeffreys Bank)	94 m	Gravel/boulder with thin mud veneer.	Gravel base exposed, boulders moved, reduced abundance of erect sponges and associated epifaunal species.		Submersible and video observations in same location in 1987 and 1993, changes attributed to trawling.
2	Freese et al. 1999	Gulf of Alaska	206-274 m	93% pebble, 5% cobble, 2% boulder.	Boulders displaced, groundgear left furrows 1-8 cm deep in less compact sediment, layer of silt removed, S reductions in abundance of sponges, anemones, and sea whips, damage to sponges, sea whips and brittle stars.		Video observations from a submersible 2-5 hr after single trawl tows in area exposed to little or no commercial trawling for about 20 years.
3	Van Dolah et al. 1987	Georgia, SE U.S. coast	20 m	Smooth rock with thin layer of sand and attached epifauna.	Reduced abundance of and damage to large sponges and soft corals, esp barrel sponges and stick corals; no S effects on abundance of vase/finger sponges, or stony corals.	Full recovery of damaged organisms and abundance within 12 mos.	Experimental study using diver counts of large sponges and corals before, immediately after, and 12 mos after a single trawl tow in an un-exploited area.

Table 7- Effects of Otter Trawls on Gravel/Rock Substrate Habitat: Summary of Published Studies
S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.1.4 Otter Trawls – Mixed Substrates

Three studies of the effects of otter trawls on mixed substrates are summarized (Table 8). All three were conducted in North America and relied on sonar and observations made by divers or from a submersible. One of them (2) combined submersible observations and benthic sampling to compare the physical and biological effects of trawling in a lightly fished and heavily fished location in California with the same depth and variety of sediment types. One was a survey of seafloor features produced by trawls in a variety of bottom types (1) and the other primarily examined the physical effects of single trawl tows on sand and mud bottom (3).

Physical effects

Trawl doors left tracks in sediments that ranged from less than 5 cm deep in sand to 15 cm deep in mud (1,3). In mud, fainter marks were also made between the door tracks, presumably by the footgear (1). A heavily trawled area had fewer rocks, shell fragments, and biogenic mounds than a lightly trawled area (2).

Biological effects

The heavily trawled area in California had lower densities of large epifaunal species (e.g., sea slugs, sea pens, starfish, and anemones) and higher densities of brittle stars and infaunal nematodes, oligochaetes, and one species of polychaete (2). There were no differences in the abundance of molluscs, crustaceans, or nemerteans between the two areas. However, since this was not a controlled experiment, these differences could not be attributed to trawling. Single trawl tows in Long Island Sound attracted predators and suspended epibenthic organisms into the water column (3).

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Canadian DFO 1993	Bras d'Or Lakes, Nova Scotia (Canada)	10-500 m	Mud, sand, gravel, and boulders	Trawl doors left parallel marks (furrows and berms), fainter marks from footgear, primarily in mud.		Side scan sonar survey after area was closed to mobile gear for 1 yr.
2	Engel and Kvitek 1998	California (USA)	180 m	Gravel, sand, silt, and clay	S fewer rocks, shell fragments, rocks and mounds in HT area; lower densities of large epibenthic taxa in HT area (S for seapens, seastars, anemones, and sea slugs), higher densities of nematodes, oligochaetes, brittlestars and one species of polychaete in HT area, no differences between areas for crustaceans, molluscs, or nemerteans.		Used a submersible and grab samples (3 yrs) to compare lightly trawled (LT) and heavily trawled (HT) commercial fishing sites with same sediments and depth.
3	Smith et al. 1985	Long Island Sound, New York (USA)	Not given	Sand and mud	Tracks in sediment (<5 cm in sand, 5-15 cm in mud), attraction of predators, suspension of epibenthic organisms.	Tracks "naturalized" by tidal currents.	Video and diver observations.

Table 8- Effects of Otter Trawls on Mixed Substrate Habitat: Summary of Published Studies
S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.2 NEW BEDFORD SCALLOP DREDGES

1.4.5.2.1 New Bedford Scallop Dredges – Sand

Three studies of the effects of New Bedford scallop dredges on sand substrate are summarized, all performed since 1990 (Table 9). One was conducted in an estuary on the Maine coast (3) and two on offshore banks in the Gulf of Maine (1,2). Two of them were observational in nature, but did not include any direct observations of dredge effects. The other one was a controlled experiment conducted in an unexploited area in which a single dredge was towed repeatedly over the same area of bottom during a single day. One study examined physical effects and two examined physical and biological effects. One of them included an analysis of geochemical effects to disturbed silty-sand sediments.

Physical effects
Dredging disturbed physical and biogenic benthic features (sand ripples and waves, shell deposits [1], and amphipod tube mats [2]), caused the loss of fine surficial sediment (3), and reduced the food quality of the remaining sediment (3). Sediment composition was still altered six months after dredging, but the food quality of the sediment had recovered by then.

Biological effects
There were significant reductions in the total number of infaunal individuals in the estuarine location immediately after dredging and reduced abundances of some species (particularly one family of polychaetes and photid amphipods), but no change in the number of taxa (3). Total abundance was still

reduced four months later, but not after six months. The densities of two megafaunal species (a tube-dwelling polychaete and a burrowing anemone) on an offshore bank were significantly reduced after commercial scallop vessels had worked the area (2).

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Auster et al. 1996	Stellwagen Bank, Gulf of Maine (USA)	20-55 m	Coarse sand	Disturbance of storm sand ripples and low sand waves, dispersal of shell deposits in wave troughs.		Examined gear tracks in side-scan sonar images.
2	Langton & Robinson 1990	Fippennies Ledge, Gulf of Maine (USA)	80-100 m	Gravelly sand with some gravel, shell hash, and small rocks	Coarser substrate, disruption of amphipod tube mats, piles of small rocks and scallop shells dropped from surface, S reductions in densities of tube dwelling polychaete and burrowing anemone.		Submersible observations made two years apart, before and after commercial dredging of area.
3	Watling et al. 2001	Damariscotta River, Maine (USA)	15 m	Silty sand	Loss of fine surficial sediments, lowered food quality of sediment, reduced abundance of some taxa, no changes in number of taxa, S reductions in total number of individuals 4 mos after dredging.	No recovery of fine sediments, full recovery of benthic fauna and food value within 6 mos.	Experimental study (23 tows in one day), effects on macrofauna (mostly infauna) evaluated 1 day and 4 and 6 mos after dredging.

Table 9- Effects of New Bedford Scallop Dredges on Sand Habitat: Summary of Published Studies
S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.2.2 New Bedford Scallop Dredges - Mixed Substrates

Three studies have been conducted on mixed glacially-derived substrates, two of them over 20 years ago and one 10 years ago (Table 10). All were done in the northwest Atlantic (one in the U.S. and two in Canada) at depths of 8 to 50 m. Two observational studies examined physical effects and one experimental study examined effects on sediment composition to a sediment depth of 9 cm. The experimental study evaluated the immediate effects of a single dredge tow. None of these studies evaluated habitat recovery or biological effects, although one (3) examined geochemical effects.

Physical effects

Direct observations in dredge tracks in the Gulf of St. Lawrence documented a number of physical effects to the seafloor, including bottom features produced by dredge skids, rings in the chain bag, and the tow bar (1,2). Gravel fragments were moved and overturned and shells and rocks were dislodged or plowed along the bottom (2). Sampling one day after a single dredge tow revealed that surficial sediments were re-suspended and lost and that the dredge tilled the bottom, burying surface sediments and organic matter to a depth of 9 cm, increasing the grain size of sediments above 5 cm, and disrupting a surface diatom mat (3). Microbial biomass at the sediment surface increased as a result of dredging.

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Caddy 1968	Northumberland Strait, Gulf of St. Lawrence, Canada	20 m	Mud and sand	Drag tracks (3 cm deep) produced by skids, smooth ridges between them produced by rings in drag belly, dislodged shells in dredge tracks.		Diver observations of physical effects of two tows.
2	Caddy 1973	Chaleur Bay, Gulf of St. Lawrence, Canada	40-50 m	Gravel over sand, with occasional boulders	Suspended sediment, flat track, marks left by skids, rings and tow bar, gravel fragments less frequent (many overturned), rocks dislodged or plowed along bottom.		Submersible observations of tow tracks made less than 1 hr after single dredge tows.
3	Mayer et al. 1991	Coastal Gulf of Maine (USA)	8 m	Mud, sand and shell hash	Lowered sediment surface by 2 cm,injection of organic matter and finer sediment into lower 5-9 cm, increased mean grain size in upper 5 cm, disruption of surface diatom mat, increased microbial biomass at sediment surface.		Experimental study, compared dragged and undragged sites before and 1day after a single dredge tow.

Table 10- Effects of New Bedford Scallop Dredges on Mixed Substrate Habitat: Summary of Published Studies

S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.3 Hydraulic Clam Dredges

1.4.5.3.1 Hydraulic Clam Dredges – Sand

Results of six hydraulic dredge studies in sandy substrates are summarized (Table 11). Five of them (2-6) examined the effects of "cage" dredges of the type used in the Northeast region of the U.S. and one (1) examined the effects of escalator dredges, which affect sandy bottom habitats similarly to "cage" dredges. Three of them were published prior to 1990, and three since then. Three were performed in North America (two in the U.S. and one in Canada), one in the Adriatic Sea and two in Scotland. There have been no published studies in North America since 1982. One of the North American studies was conducted on the U.S. continental shelf at a depth of 37 m and two in near shore waters and depths of 7 – 12 m. The two European studies were done in even shallower water (1.5 – 7 m). The North American studies were all observational in nature and the European studies were controlled experiments. One study compared effects in commercially dredged and un-dredged areas and four were conducted in un-dredged areas. The sixth study compared infaunal communities in an actively dredged, a recently dredged, and an un-dredged location off the New Jersey coast. All six studies examined physical and biological effects of dredging. Recovery was evaluated in four cases for periods ranging from just a few minutes (sediment plumes) to 11 weeks.

Physical effects

Hydraulic clam dredges created steep-sided trenches 8-30 cm deep that started deteriorating immediately after they were formed (1, 3-6). Trenches in a shallow, inshore location with strong bottom currents filled in within 24 hours (4). Trenches in shallow, protected, coastal lagoons were still visible two months after they were formed (5). Hydraulic dredges also fluidized sediments in the bottom and sides of trenches (6), created mounds of sediment along the edges of the trench (6), re-suspended and dispersed fine sediment (4), and caused a re-sorting of sediments that settled back into trenches (2). In one study (6), sediment in the bottom of trenches was initially fluidized to a depth of 30 cm and in the sides of the trench to 15 cm. After 11 weeks, sand in the bottom of the trench was still fluidized to a depth of 20 cm. Silt clouds only last for a few minutes or hours (3,4). Complete recovery of seafloor topography, sediment grain size, and sediment water content was noted after 40 days in a shallow, sandy environment that was exposed to winter storms (1).

Biological effects

Some of the larger infaunal organisms (e.g., polychaetes, crustaceans) retained on the wire mesh of the conveyor belt used in an escalator dredge, or that drop off the end of the belt, presumably die (1). Benthic organisms that are dislodged from the sediment, or damaged by the dredge, temporarily provided food for foraging fish and invertebrates (1,4). Hydraulic dredging caused an immediate and significant reduction in the total number of infaunal organisms in two studies (1,6) and in the number of macrofaunal organisms in a third study (5). There were also significant reductions in the number of infaunal species in one case (6) and in the number of macrofaunal species and biomass in another (5). In this study (5), polychaetes were most affected. One study failed to detect any reduction in the abundance of individual taxa (1). Evidence from the study conducted off the New Jersey coast indicated that the number of infaunal organisms and species, and species composition, were the same in actively dredged and un-dredged locations (2).

Recovery times for infaunal communities were estimated in three studies. All of them (1,5,6) were conducted in very shallow (1.5-7 m) water . Total infaunal abundance and species diversity had fully recovered only five days after dredging in one location where tidal currents reach maximum speeds of three knots (6). Some species had recovered after 11 weeks. Total abundance recovered 40 days after dredging in another location exposed to winter storms, when the site was re-visited for the first time (1). Total infaunal abundance (but not biomass) recovered within two months at a protected, commercially exploited site (5), where recovery was monitored at three-week intervals for two months, but not at a nearby, unexploited site. The actual recovery time at the exposed sub-tidal site (1) was probably much quicker than 40 days, the only point in time when the post-experimental observations were made.

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Hall et al. (1990)	Scotland	7 m	Fine sand	Shallow trenches (25 cm deep) and large holes, sediment "almost fluidized," S increase in median grain size in trenches, S reductions in numbers of infaunal organisms, no effect on abundance of individual species, some mortality (not assessed) of large polychaetes and crustacea retained on conveyor belt or returned to sea surface.	Complete recovery of physical features and benthic community after 40 days, filling of trenches and holes accelerated by winter storms.	Experimental study in unexploited area to evaluate effects of commercial escalator dredging activity, recovery evaluated after 40 days.
2	MacKenzie, 1982	Southern New Jersey (USA)	37 m	Very fine to medium sand	Re-sorting of sediments, no effect on number of infaunal individuals or species, or on species composition.		Comparison of actively fished, recently fished and never fished areas on the continental shelf.
3	Medcof & Caddy 1971	Southern Nova Scotia (Canada)	7-12 m	Sand and sand-mud	Smooth tracks with steep walls, 20 cm deep; sediment cloud.	Sediment plume lasted 1 minute; dredge tracks still clearly visible after 2-3 days.	SCUBA & submersible observations of the effects of individual tows.
4	Meyer et al. 1981	Long Island, New York (USA)	11 m	Very fine to medium sand	>20 cm deep trench, mounds on either side of trench, silt cloud, attraction of predators.	Trench nearly indistinct, predator abundance normal after 24 hours; silt settled in 4 minutes.	SCUBA observations following a single tow in a closed area, effects evaluated after 24 hrs.
5	Pranovi & Giovanardi 1994	Adriatic Sea (Italy)	1.5-2 m	Sand	8-10 cm deep trench; S decrease in total	After 2 mos, dredge tracks still visible,	Experimental dredging (single tow) in previously

					abundance, biomass, and diversity of benthic macrofauna in fishing ground; no S effects outside fishing ground.	densities (especially of small species and epibenthic species) in fishing ground recovered, biomass did not.	dredged and undredged areas in coastal lagoon, recovery monitored every 3 weeks for 2 mos.
6	Tuck et al. 2000	Outer Hebrides, Scotland	2-5 m	Medium to fine sand	Steep-sided trenches (30 cm deep), sediments fluidized up to 30 cm, S decrease in total abundance and number of infaunal species, polychaetes most affected.	Trenches no longer visible but sand still fluidized after 11 weeks, species diversity and total abundance recovered within 5 days, abundance of some species recovered after 11 weeks.	Experimental dredging (individual tows at 6 sites) in area closed to commercial dredging, recovery evaluated after 11 weeks.

Table 11- Effects of Hydraulic Clam Dredges on Sand Substrate Habitat: Summary of Published Studies

S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.3.2 Hydraulic Clam Dredges - Mixed Substrates

An in situ evaluation of hydraulic dredge effects in sand, mud, and coarse gravel in the mid-Atlantic Bight indicated that trenches fill in quickly, within several days in fine sediment and more rapidly than that in coarse gravel (Table 12). Dredging dislodged benthic organisms from the sediment, attracting predators.

Reference	Location	Depth	Sediment	Effects	Recovery	Approach
Murawski & Serchuk 1989	Mid-Atlantic Bight, USA	Not given	Sand, mud and coarse gravel	Trench cut, temporary increase in turbidity, disruption of benthic organisms in dredge path, attraction of predators.	Trenches filled quickly in coarse gravel, but took several days in fine sediments.	Submersible observations following hydraulic cage dredge tows.

Table 12- Effects of Hydraulic Clam Dredges on Mixed Substrate Habitat: Summary of Published Studies

S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.4 Multiple Gear Types

1.4.5.4.1 Multiple Gear Types – Sand

The results of a single observational study of multiple gear types on sand habitats (at depths that varied from 15 to 70 m) are summarized in this report (Table 13). This study (2) compared sandy shallow and deep water sites on the south coast of England that were exposed to low, medium, and high levels of fishing effort by mobile and fixed gear. Low effort areas that were closed to trawls and dredges had more emergent epifauna (soft corals and hydroids) and were dominated by relatively high-biomass epifauna and infauna, whereas high effort areas fully exposed to fixed and mobile gear had higher abundances of small-bodied organisms. Deep (53-70 m) coarse-medium sand offshore sites were more affected by fishing than deep, medium sand or shallow (15-17 m), inshore, fine sand sites.

Reference	Location	Depth	Sediment	Effects	Recovery	Approach
Kaiser et al. 2000b	England (South Devon Coast)	15-70 m	Fine, medium, and coarse sand	No S effect of high fishing effort on numbers of infaunal or epifaunal species or individuals; reduced abundance of larger, less mobile, and emergent epifauna, higher abundance of more mobile species, fewer high-biomass organisms and more smaller-bodied species in high effort areas, infauna in deeper coarse-medium sand habitat most affected by fishing.		Compared benthic communities in areas of high, medium and low fishing intensity by fixed and mobile gears.

Table 13- Effects of Multiple Gears on Sand Substrate Habitat: Summary of Published Studies

1.4.5.4.2 Multiple Gear Types – Gravel/Rock

Two recent observational studies of mobile gear effects on sediments and epifauna in gravel bottom on the northern edge of eastern Georges Bank (42-90 m) are summarized (Table 14). Study sites were distinguished by depth and the presence or absence of fishing disturbance. Sediments in undisturbed sites were slightly coarser with more sand and cobble. There were significantly more organisms, higher biomass, and greater species diversity at the undisturbed sites in both depths, but there were also significantly higher values in disturbed and undisturbed deep sites than in disturbed and undisturbed shallow sites. Percent cover of an encrusting colonial polychaete was also significantly higher at these sites, but emergent hydroids and bryozoans were significantly more abundant in deep, undisturbed sites and at shallow, disturbed sites. Overall, emergent epifauna was more abundant in deep water, but there was no significant disturbance effect.

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1,2	Collie et al. 1997, 2000	Eastern Georges Bank (U.S. and Canada)	42-90 m	Pebble/cobble "pavement" with some overlying sand	S higher total densities, biomass, and species diversity in undisturbed sites, but also in deeper water (i.e. effects of fishing could not be distinguished from depth effects), 6 species abundant at U sites, rare or absent at D sites; sediments in U sites slightly coarser with more sand and cobble; percent cover of tube-dwelling polychaetes, hydroids, and bryozoans S higher in deep water, but no disturbance effect.		Benthic sampling, video and still photos in two shallow (42-47 m) and four deep (80-90 m) sites disturbed (D) and undisturbed (U) by trawls and scallop dredges.

Table 14- Effects of Multiple Gear Types on Gravel/Rocky Substrate: Summary of Published Studies

S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.4.5.4.3 Multiple Gear Types - Mixed Substrates

Six observational studies of the effects of multiple gear types on mixed substrates are summarized (Table 15). Surveys were conducted in the Gulf of Maine inside and outside an inshore area closed to mobile fishing gear and in an offshore area that was disturbed by mobile fishing gear (1). A series of three publications examined long-term (100+ years) changes in benthic habitats and communities in the Wadden Sea, some of which were attributed to fishing (2-4). A study in New Zealand (5) tested ten predictions of how increasing fishing activity affects benthic communities by comparing benthic samples and underwater video footage from areas exposed to varying degrees of commercial fishing effort. A sixth study (6) examined areas on eastern Georges Bank that were affected by mobile bottom gear.

Significant increases were observed in the abundance of sea cucumbers and emergent epifauna, and in the number of bottom depressions created by organisms such as lobsters, scallops, and crabs, on sand-cobble-shell substrate inside the Gulf of Maine closed area (1). Side scan sonar and ROV surveys of Stellwagen Bank revealed evidence that otter trawls and New Bedford scallop dredges disturb sand waves and ripples, disperse shell deposits, remove emergent epifauna, and disturb microalgal cover (1). Disturbed sand and gravel areas of Georges Bank were characterized by trawl and dredge tracks, sparse epifauna, mounds of gravel presumably produced by fishing gear, and smoother bottom (6). In the New Zealand study (5), there were four significant effects of increased fishing activity by bottom trawls, Danish seines, and toothed scallop dredges in mud and sand substrates that were consistent across all sampling methodologies. These were reduced density of large epifauna, echinoderms, and long-lived surface dwelling organisms, and an increased density of small, opportunistic species. The loss of biogenic reefs and changes in benthic community composition (fewer mollusk and amphipod species and more polychaete species) in the Wadden Sea were in part attributed to fishing activity (2-4).

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Auster et al. 1996	Coastal Gulf of Maine (USA)	30-40 m	Sand-shell	S more sea cucumbers and bottom depressions inside closed area.		ROV and video observations inside and outside an area closed to mobile gear for 10 years.
1	Auster et al. 1996	Coastal Gulf of Maine (USA)	30-40 m	Cobble-shell	S more emergent epifauna inside closed area.		ROV and video observations inside and outside an area closed to mobile gear for 10 years.
1	Auster et al. 1996	Stellwagen Bank (Gulf of Maine, USA)	20-55 m	Sand with gravel and shell	Disturbed sand ripples and sand waves, dispersed shell deposits, absence of epifauna and reduced microalgal cover in trawl and dredge tracks.		Side-scan sonar survey and ROV observations.
2,3,4	Reise and Schubert, 1987; Riesen and Reise 1982; Reise 1982	Wadden Sea (Netherlands)	<23 m	Mud, coarse sand and some pebbles	Loss of oyster and Sabelleria reefs, decrease in abundance of 28 species (molluscs and amphipods), 23 "new" species (mostly polychaetes).		Compared benthic surveys conducted during time period when oysters were over-exploited and trawl fishery developed on Sabellaria reefs (1869-1986)..
5	Thrush et al. 1998	Hauraki Gulf, New Zealand	17-35 m	Mud and sand	S reductions in density of large epifauna, echinoderms, and long-lived surface dwellers; S increases in density of small, opportunistic species; 15-20% variability in macrofaunal community composition attributed to fishing pressure.		Tested ten predictions of the effects of increasing fishing intensity on benthic community structure by comparing samples and video images from 18 stations exposed to varying degrees of commercial fishing pressure by bottom trawls, Danish seines, and scallop dredges.
6	Valentine and Lough 1991	Eastern Georges Bank		Sand and gravel	Trawl and dredge tracks in sediments, sparse epifauna, gravel mounds and smoother bottom in disturbed areas.		Side scan sonar and submersible observations of area presumed to be disturbed by trawls and scallop dredges.

Table 15- Effects of Multiple Gears on Mixed Substrate Habitat: Summary of Published Studies
S = statistically significant; U = undisturbed; D = disturbed; HT = heavily trawled; LT = lightly trawled

1.5 Vulnerability of Essential Fish Habitat to Bottom-tending Fishing Gears

The purpose of this section is to evaluate potential adverse effects of bottom-tending fishing gears regulated by the Magnuson-Stevens Act (MSA) on benthic EFH in the Northeast region of the U.S. as required by the EFH final rule, 50 CFR 600.815(a)(2)(I). The EFH final rule recommends that the evaluation consider the effects of each fishing activity on each type of habitat found within the EFH for any affected species and life stage. The EFH rule further recommends that the following information be reviewed in making an evaluation: intensity, extent, and frequency of any adverse effects on EFH; the types of habitat within EFH that may be adversely affected; habitat functions that may be disturbed; and conclusions regarding whether and how each fishing activity adversely affects EFH.

1.5.1 Vulnerability Requirements

The EFH final rule requires that EFH designations be based upon the best available information. This information may fall into four categories that range from the least specific (Level 1) to the most specific (Level 4). These categories are defined as follows:

Level 1: Presence/absence data are available to describe the distribution of a species (or life history stage) in relation to potential habitats for portions of its range.
Level 2: Quantitative data (i.e., density or relative abundance) are available for the habitats occupied by a species or life history stage.
Level 3: Data are available on habitat-related growth, reproduction, and/or survival by life history stage.
Level 4: Data are available that directly relate the production rates of a species or life history stage to habitat type, quantity, and location.

Existing EFH designations in the Northeast region are based primarily on Level 2 information. This level of information is inadequate for making definitive determinations of the consequences of fishing-related habitat alterations on EFH for any species or life stage in the Northeast region because the habitat alterations caused by fishing can not be linked to any known effect on species productivity. Therefore, this section of the report qualitatively evaluates the vulnerability of benthic EFH for each species and life history stage (eggs, larvae, juveniles, adults, and spawning adults) in the Northeast region to the effects of five bottom-tending fishing gear types (Table 16 - Table 57). Vulnerability is defined as the likelihood that the functional value of EFH would be adversely affected as a result of fishing. Given the limited nature of the information available for this evaluation, emphasis was placed on the identification of potential adverse impacts of fishing on benthic EFH.

Information used to perform these evaluations included: 1) the EFH designations adopted by the Mid-Atlantic, New England, and South Atlantic Fishery Management Councils; 2) the results of a Fishing Gear Effects Workshop convened in October 2001 (NREFHSC 2002); 3) the information provided in this report, including the results of existing scientific studies, and the geographic distribution of fishing gear use in the Northeast region; and 4) the habitats utilized by each species and life stage as indicated in their EFH designations and supplemented by other references.

1.5.2 Species-specific Vulnerability Tables

The following five fishing gear classifications were evaluated: otter trawls (OT); New Bedford style scallop dredges (SD); hydraulic clam dredges (CD); pots and traps (PT); and sink gill nets and bottom long lines (NL). Vulnerability was evaluated according to four broad categories: none (0); low (L); moderate (M); and high (H), based upon a matrix analysis of habitat function, habitat sensitivity and gear use. The matrix analysis consistently applied these criteria to all benthic life stages and species. Adult and spawning adult life stages were combined due to the difficulty in distinguishing between the two. In some cases (e.g., pelagic life stages that are not vulnerable to bottom-tending fishing gear effects) a vulnerability ranking was not applicable (NA).

A number of criteria were considered in the evaluation of the vulnerability of EFH for each species and life stage. The rationale for each determination is outlined by species in Table 16 through Table 57. First, the habitat's value to each species and life stage was characterized to the extent possible, based on its function in providing shelter, food and/or the right conditions for reproduction. For example, if the habitat provided shelter from predators for juvenile or other life stages, gear impacts that could reduce shelter were of greater concern. In cases where a food source was closely associated with the benthos (e.g. infauna), the ability of a species to use alternative food sources was evaluated. Additionally, since benthic prey populations may also be adversely affected by fishing, gear impacts that could affect the availability of prey for bottom-feeding species or life stages were of greater concern than if the species or life stages were piscivorous. In most cases habitat usage was determined from the information provided in the EFH Source Documents (NOAA Technical Memorandum NMFS-NE issues 123-153) with additional information from Colette and Klein-MacPhee (2002).

Another criterion was the sensitivity of the habitat to disturbance and its ability to recover from any effects of fishing given the range of natural disturbances experienced in the environment. These considerations took into account available information on the energy level of the natural environment, including the degree of disturbance from tidal and storm-related currents. High-energy sand habitats were considered to be less vulnerable to fishing gear effects than low energy deep-water habitats or structurally complex habitats. This concept is adopted from the models developed by Auster and Langton (1999) and the Northeast Fishing Gear Effects Workshop (NREFHSC 2002).

The extent to which each of the five bottom-tending gear types is used in areas that are designated as EFH for any given species and life stage was evaluated by examining the spatial distribution of fishing activity for individual gears for the period 1995-2001. Maps of fishing activity within ten-minute squares of latitude and longitude were derived from NMFS vessel trip report and clam logbook databases. Squares were ranked according to the number of trips for fixed gear, and either the number of hours absent from port or the number of hours fishing for mobile gears. This evaluation included the predominant substrates and depth ranges in which each gear is used. Habitats or areas that are not normally fished with a particular gear were considered to be less vulnerable to that gear.

The pot/trap and net/line gear types were considered to have the least impact of the five gear types evaluated. Based on the limited information available (Eno *et al.* 2001, NREFHSC 2002), the vulnerability of all EFH to pot and trap usage was considered to be low and is not discussed in the species accounts. Similarly, there is little scientific information that evaluates the effects of gill nets and long-lines on benthic marine habitats, and none evaluates these effects in the Northeast region. The panel of experts that met in October 2001 ranked their concern over impacts from fixed gear well below concern about mobile bottom-tending gears (NREFHSC 2002). Like pots and traps, the vulnerability of EFH for all benthic species and life stages to nets and lines was rated as low (L) and is not discussed in the species accounts.

The greatest concern is for the vulnerability of benthic EFH to mobile bottom-tending gears, which is addressed by species in Table 16- Table 57. In the Northeast U.S., these gear types include various types of bottom otter trawls, New Bedford scallop dredges, and hydraulic clam dredges. Otter trawls are responsible for most of the fisheries landings throughout the Northeast region. They are used in a variety of substrates, depths, and areas. Scallop dredges are used in sand and gravel substrates, and hydraulic dredges are used only in sand, shell, and small gravel within well-defined areas.

The information in the species EFH vulnerability tables is arranged in columns that summarize the geographical extent of EFH for each life stage, its depth range, seasonal occurrence, and a brief EFH description that includes – for benthic life stages – substrate characteristics. The information in columns 2-5 was derived from EFH designations that have been adopted by the three Atlantic coast Fishery Management Councils. Additional information is provided at the bottom of each table to explain the rationale that was used in making the gear-specific EFH vulnerability rankings. This information was extracted from the EFH source documents and other sources and sometimes differs somewhat from the information included in the EFH designation.

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	30 - 90	All year in GOME Dec - June on GB Peaks April & May both	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, GB, Southern NE and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass Bay to Cape Cod Bay, MA	30-130	Between January and August, with peaks in April and May	Surface waters	NA	NA	NA	NA	NA
Juveniles	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass Bay to Cape Cod Bay, MA	45-150		Bottom habitats with fine-grained sediments or substrate of sand or gravel	M	M	0	L	L
Adults	GOME, GB and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass Bay to Cape Cod Bay, MA	45-175		Bottom habitats with fine-grained sediments or a substrate of sand or gravel	H	H	0	L	L
Spawning Adults	GOME, GB and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass Bay to Cape Cod Bay, MA	<90	March through June	Bottom habitats of all substrate types	H	H	0	L	L

Rationale: American plaice (Hippoglossoides platessoides) juveniles, adults, and spawning adults are concentrated in the Gulf of Maine, where they occupy a variety of habitat types with substrates of gravel or fine grained sediments including sand. Plaice avoid rocky and hard bottom areas and prefer fine, sticky but gritty sand mixtures and mud, as well as oozy mud in deep basins (Klein-MacPhee 2002a). Plaice have been caught a considerable distance off the bottom and move off the bottom at night (Klein-MacPhee 2002a). They feed primarily on epibenthic invertebrates (mostly echinoderms and amphipods), so there is a potential that prey resources may be affected adversely by otter trawls and scallop dredges, particularly in areas of lower energy and expected slower habitat recovery. EFH vulnerability to these gears was rated as high for adults and moderate for juveniles primarily because spawning occurs on the bottom. Since hydraulic clam dredges do not typically operate in the Gulf of Maine, vulnerability for this gear was rated as none.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year;OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT Pots and Traps; NL - Gill Nets and Longlines; NA - not applicable; 0 –No vulnerability; L - Low vulnerability; M - Moderate vulnerability; H - High vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 16 - American Plaice EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Englishman/ Machias Bay to Blue Hill Bay; Sheepscot R., Casco Bay, Saco Bay, Great Bay, Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	<110	Begins in fall, peaks in winter and spring	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Penobscot Bay; Sheepscot R., Casco Bay, Saco Bay, Great Bay, Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	30-70	Spring	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel	H	H	0	L	L
Adults	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10-150		Bottom habitats with a substrate of rocks, pebbles, or gravel	M	M	L	L	L
Spawning Adults	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and following estuaries: Englishman/ Machias Bay to Blue Hill Bay; Sheepscot R., Mass Bay, Boston Harbor, Cape Cod Bay, MA	10-150	Spawn during fall, winter, and early spring	Bottom habitats with a substrate of smooth sand, rocks, pebbles, or gravel	M	M	L	L	L

Rationale: Atlantic cod (Gadus morhua) are distributed regionally from Greenland to Cape Hatteras, NC, from nearshore to depths greater than 400 m. In U.S. waters, they are concentrated on Georges Bank and in the Gulf of Maine, on rough bottom from 10 - 150 m (Klein-MacPhee 2002b; Fahay et al. 1999). Eggs and larvae are pelagic so EFH vulnerability is not applicable.

Juvenile cod are found mostly in nearshore shoal waters or on offshore banks. Cobble is preferred over finer grained sediments, and this life stage appears to use benthic structure and cryptic coloration to escape from predation (Fahay et al. 1999). Juvenile cod may benefit, perhaps strongly, from physical and biological complexity (Lindholm et al. 2001) (see discussion in 1.4). Otter trawls and scallop dredges have been shown to reduce habitat complexity (see Section 1.4) therefore EFH Vulnerability to these gear types is rated as high since the gear may affect the functional value of EFH for this life stage. Vulnerability to clam dredges was rated as none since this gear is not operated in juvenile cod EFH (see 1.3).

Adults and spawning adults occupy a variety of hard bottom habitat types including rock, pebbles, and gravel, and tend to avoid finer sediments.

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Cod are euryphagous, eating a wide variety of prey including fish, decapods, amphipods, and polychaetes (Fahay et al. 1999). Although adult cod are primarily found on rough bottom, the scientific literature does not indicate that this habitat type serves the same function as it does for juvenile cod, which is ranked as high. Based on the variable diet and lack of evidence for direct functional value of benthic habitat. EFH vulnerability to otter trawls and scallop dredges is rated as moderate. Adult cod may use areas where clam dredges operate, such as the nearshore waters of New Jersey, on a seasonal basis. Clam dredges operate only in sand (NREFHSC 2002), and the recovery of benthic communities from the effects of clam dredging in nearshore, sandy habitats is fairly rapid. Clam beds are not chronically disturbed by dredging since the population of clams, which are benthic infauna, must recover before fishing is again profitable (NREFHSC 2002). Based on this information and the rationale described for otter trawls and scallop dredges, habitat vulnerability for hydraulic clam dredges was rated as low. EFH vulnerability for adults applies to spawning adults as well.									
Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 – No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**									

Table 17 - Atlantic Cod EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB		Between late fall and early spring, peak Nov. and Dec.	Pelagic waters to the sea floor	0	0	0	0	0
Larvae	GOME, GB			Surface waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay	M	M	0	L	L
Adults	GOME, GB	100-700		Bottom habitats with a substrate of sand, gravel, or clay	M	M	0	L	L
Spawning Adults	GOME, GB	<700	Between late fall and early spring, peaks in Nov. and Dec.	Bottom habitats with a substrate of soft mud, clay, sand, or gravel; rough or rocky bottom locations	M	M	0	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					O T	SD	CD	PT	NL
				along slopes of the outer banks					

Rationale: Atlantic halibut (Hippoglossus hippoglossus) are found in the boreal and subarctic Atlantic, south to New Jersey, and were once fairly common from Nantucket Shoals to Labrador (Klein-MacPhee 2002a). They have been found at depths from 25 m to 1000 m, but 700 - 900 m is probably the deepest they are found in any numbers.

Atlantic halibut eggs are bathy-pelagic and are fertilized on the bottom (Klein-MacPhee 2002a, Cargnelli et al. 1999g). Since eggs occur close to, but not on the bottom, scallop dredges, otter trawls, and hydraulic clam dredges are not expected to affect the functional value of the habitat for this life stage and EFH vulnerability was rated as none.

Juvenile, adult and spawning adult halibut occupy a variety of habitat types north of Nantucket Shoals. Adults are not found on soft mud or on rock bottom (Cargnelli et al. 1999g), however, spawning is occasionally associated with complex habitats. Juvenile halibut feed mostly on annelid worms and crustaceans, then transition to a diet of mostly fish as adults (Klein-MacPhee 2002a). EFH vulnerability to scallop dredges and otter trawls was rated as moderate for juveniles and adults. EFH vulnerability for clam dredges was rated as none since this gear type does not operate in halibut EFH (see 1.3).

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 18 - Atlantic Halibut EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB and following estuaries: Englishman/ Machias Bay, Casco Bay, & Cape Cod Bay	20 - 80	July through November	Bottom habitats with a substrate of gravel, sand, cobble, shell fragments & aquatic macrophytes, tidal currents 1.5-3 knots.	L	L	0	L	L
Larvae	GOME, GB, Southern NE and following estuaries: Passamaquoddy Bay to Cape Cod Bay, Narragansett Bay, & Hudson R./ Raritan Bay	50 - 90	Between August and April, peaks from Sept. - Nov.	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB, Southern NE and Middle Atlantic south to Cape Hatteras and following estuaries: Passamaquoddy Bay to Cape Cod Bay; Buzzards	15- 135		Pelagic waters and bottom habitats	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	Bay to Long Island Sound; Gardiners Bay to Delaware Bay								
Adults	GOME, GB, southern NE and middle Atlantic south to Cape Hatteras and following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Cape Cod Bay; Buzzards Bay to Long Island Sound; Gardiners Bay to Delaware Bay; & Chesapeake Bay	20-130		Pelagic waters and bottom habitats	NA	NA	NA	NA	NA
Spawning Adults	GOME, GB, southern NE and middle Atlantic south to Delaware Bay and Englishman/ Machias Bay Estuary	20 - 80	July through November	Bottom habitats with a substrate of gravel, sand, cobble and shell fragments, also on aquatic macrophytes	L	L	0	L	L

Rationale: Atlantic herring (Clupea harengus) is a coastal pelagic species ranging from Labrador to Cape Hatteras in the western Atlantic (Reid et al. 1999,
Munroe 2002). For most pelagic life stages (larvae, juveniles, adults) EFH vulnerability to bottom-tending fishing gear is not applicable. Atlantic herring eggs are laid in high energy, benthic habitats on rocky, pebbly, gravelly or shell substrates or macrophytes (Reid et al. 1999, Munroe 2002). These habitats are less susceptible to fishing gear impacts since they have evolved under a high energy disturbance regime (strong bottom currents). Vulnerability of herring egg EFH to scallop dredges and otter trawls is considered to be low. Although these gears may directly effect the eggs, only the effect of the gear on the functional value of the habitat was considered for this evaluation. EFH vulnerability from clam dredges were considered to be none since this gear does not operate in areas of herring egg EFH.

Spawning adults are closely associated with the bottom. Effects on the functional value of habitat from mobile gears are unknown and were rated as low since spawning occurs on the bottom. EFH vulnerability from clam dredges was rated as none for the reasons described above. Spawning could be disrupted by noise associated with these gears, but this issue was not addressed as a habitat related issue.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 19 - Atlantic Herring EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (cm)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny=s, Passagassawaukeag Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart & Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	30-31	Between October and April	Bottom habitats with a gravel or cobble riffle (redd) above or below a pool in rivers	NA	NA	NA	NA	NA
Larvae			Between March and June for alevins/fry	Bottom habitats with a gravel or cobble riffle (redd) above or below a pool in rivers	NA	NA	NA	NA	NA
Juveniles		10-61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 – 92 cm/sec	NA	NA	NA	NA	NA
Adults				Oceanic adult Atlantic salmon are primarily pelagic and range from waters of the continental shelf off southern NE north throughout the GOME, dissolved oxygen above 5 ppm for migratory pathway	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (cm)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Spawning Adults		30-61 cm	October and November	Bottom habitats with a gravel or cobble riffle (redd) above or below a pool in rivers	NA	NA	NA	NA	NA

Rationale: Atlantic salmon (Salmo salar) eggs and larvae are found in riverine areas where the fishing gears under consideration are not used, so EFH vulnerability is not applicable. It is important to note that these life stages are particularly vulnerable to non-fishing related impacts such as point source discharges and polluted runoff. Juveniles and adults are pelagic in nature, and vulnerability of EFH to bottom-tending fishing gear is not applicable for these life stages.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0- No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 20 - Atlantic Salmon EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Mass Bay, and Cape Cod Bay		May through October, peaks in May and June in middle Atlantic area and in Sept. and Oct. on GB and in GOME	Bottom habitats	L	L	L	L	L
Larvae	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Mass Bay, and Cape Cod Bay			Pelagic waters and bottom habitats with a substrate of gravelly sand, shell fragments, pebbles, or on various red algae, hydroids, amphipod tubes and bryozoans	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18-110		Bottom habitats with a substrate of cobble, shells, and silt	M	M	M	L	L
Adults	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18-110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand	L	L	L	L	L
Spawning Adults	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Mass Bay, and Cape Cod Bay	18-110	May through October, peaks in May and June in middle Atlantic area, and in Sept. and Oct. on GB and in GOME	Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand	L	L	L	L	L

Rationale: Atlantic sea scallops (Placopecten magellanicus) are found on the continental shelf of the northwest Atlantic, from the Gulf of St. Lawrence south to Cape Hatteras (Packer et al. 1999a). Benthic life stages occur at depths from shore out to approximately 110 m. Larvae are pelagic, and EFH vulnerability to fishing gear impacts is not applicable.

Scallop eggs are heavier than seawater and are thought to remain on the bottom during development, but the functional value of this habitat for eggs is unknown. EFH vulnerability for eggs has been rated as low for all mobile gear types. Early juvenile scallops or spat (described as late stage larvae in the EFH descriptions) settle in areas of gravelly sand with shell fragments (Packer et al. 1999a). Larsen and Lee (1978) indicated that spat may obtain a survival advantage in areas of increased structure, including sessile branching plants and animals. The availability of suitable hard surfaces on which to settle appears to be a primary requirement for successful reproduction (Packer et al. 1999a). There is a close association between the bryozoan, Eucratea loricata, and spat. Eucratea attach to adult scallops, and have been found to contain large numbers of spat (Packer et al. 1999a). Juvenile scallops (spat) are very delicate and do not survive on shifting sand bottoms Packer et al. 1999a). Since otter trawls, scallop dredges and hydraulic clam dredges can reduce the amount of benthic structure important to juveniles (see Section 5), the vulnerability of juvenile scallop EFH to mobile benthic gears has been rated as moderate.

Adults are found in benthic habitats with some water movement, which is critical for feeding, oxygen and removal of waste; optimal growth for adults occurs at currents of 10 cm/sec (Packer et al. 1999a). Adult scallops inhabit coarse substrates, usually gravel, shell, and rocks. They are less likely to be found in areas with fine clay particles. No scientific information exists that indicates mobile fishing gear has a negative impact on the functional value of adult scallop EFH. The vulnerability of adult scallop EFH to mobile benthic gears has therefore been rated as low.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 21 - Atlantic Sea Scallop EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability* OT	SD	CD	PT	NL
Eggs	GB southwest to Nantucket Shoals and coastal areas of GOME and the following estuaries: Great Bay, Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	50 - 90	March to May, peak in April	Surface waters	NA	NA	NA	NA	NA
Larvae	GB southwest to the middle Atlantic south to Delaware Bay and the following estuaries: Great Bay, Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay, and Narragansett Bay	30 - 90	January to July, peak in April and May	Surface waters	NA	NA	NA	NA	NA
Juveniles	GB, GOME, middle Atlantic south to Delaware Bay	35-100		Bottom habitats with a substrate of pebble gravel	H	H	L	L	L
Adults	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40-150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches	H	H	L	L	L
Spawning Adults	GB, Nantucket Shoals, Great South Channel, throughout GOME	40-150	January to June	Bottom habitats with a substrate of pebble gravel or gravelly sand	H	H	L	L	L

Rationale: Haddock (Melanogrammus aeglefinus) are found from Greenland to Cape Hatteras and are common throughout the Gulf of Maine, Georges Bank, and southern New England (Cargnelli et al. 1999f, Klein-MacPhee 2002b). Juveniles older than 3 months and adults are demersal and generally found in waters from 10 to 150 m in depth. Juveniles are usually found in waters shallower than 100 m. Haddock spawn over pebble gravel substrate, and avoid ledges, rocks, kelp and soft mud (Cargnelli et al. 1999f). Haddock eggs and larvae are pelagic, and EFH vulnerability to fishing gear is not applicable.

Juvenile haddock, like juvenile cod, may benefit, perhaps strongly, from physical and biological complexity. In general, haddock have a stronger benthic affinity than cod (Klein-MacPhee 2002b). Juvenile haddock are chiefly found over pebble gravel substrates (Cargnelli et al. 1999f). Once demersal, they feed on benthic fauna, and their primary prey items are crustaceans and polychaetes. The habitat complexity that appears to be important to juvenile haddock can be reduced by otter trawls and scallop dredges, and benthic prey may be affected. Juvenile haddock EFH is considered to be highly vulnerable to these two gear types. Vulnerability to clam dredges was rated as low since there is some use of this gear in juvenile EFH.

Adult haddock are found on broken ground, gravel, pebbles, clay, smooth sand, and sticky sand of gritty consistency, with a preference for

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
smooth areas around rock patches (Klein-MacPhee 2002b). They feed indiscriminately on benthic invertebrates, and occasionally on fish. Adults (including spawning adults) occupy a variety of habitat types which may be affected by otter trawls and scallop dredges. Adults may be less closely linked to complex habitats then juveniles, but there is still some association. Haddock are expected to be more strongly linked to benthic habitats than cod since haddock primarily feed on benthic invertebrates while cod are primarily piscivorous. Benthic prey resources for haddock may be adversely affected by scallop dredges or otter trawls in areas of lower energy and expected slower habitat recovery. Overall, adult EFH vulnerability to these gear types is rated as high. Clam dredges operate only in sand and the associated recovery period is short (Table 5.15). Moreover, clam dredging is not expected to create a chronic disturbance in these areas since the population of clams, which are benthic infauna, must recover before fishing is again profitable therefore, habitat vulnerability for clam dredges is rated as low.									
Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**									

Table 22 - Haddock EFH - Vulnerability to Effect of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras, North Carolina	15-1000	March to September	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras, North Carolina	25-1000	March to September	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25-200		Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud	L	L	L	L	L
Adults	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25-200		Bottom habitats with substrates of a sand-shell mix, algae covered rocks, hard sand, pebbly gravel, or mud	L	L	L	L	L
Spawning Adults	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25-200	February to August	Bottom habitats with substrates of a sand-shell mix, algae covered	L	L	L	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
				rocks, hard sand, pebbly gravel, or mud					

Rationale: Monkfish (Lophius americanus), are demersal anglerfish found from Newfoundland south to Florida, but are common only north of Cape Hatteras (Steimle et al. 1999c). Juveniles are primarily found at depths between 40-75 m while adults are concentrated between 50-100 m. In the Gulf of Maine, adults occur primarily between the depths of 130 - 260 m. Occasionally, adults are seen at the surface. Both juveniles and adults (including spawning adults) occur on substrates ranging from mud to gravelly sand, algae and rocks. A monkfish has been observed digging depressions in the bottom substrate with its pectoral fins until its back was almost flush with the surrounding bottom (Caruso 2002).

The monkfish is a sight predator which uses its highly modified first dorsal fin as an angling apparatus to lure small fishes towards its mouth (Caruso 2002). Monkfish eat a wide array of prey items, but mainly fish and cephalopods. Monkfish have been reported to ingest a variety of seabirds. There are no indications in the literature that any monkfish life stage is habitat limited or that the functional value of its habitat could be adversely affected by fishing. Vulnerability of adult and juvenile EFH to mobile fishing gear was rated as low. Monkfish eggs and larvae are pelagic, and vulnerability to bottom-tending fishing gear is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 23 - Monkfish EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay and Cape Cod Bay	<50	Late fall and winter	Bottom habitats, generally hard bottom sheltered nests, holes, or crevices where they are guarded by parents	H	H	H	L	L
Larvae	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay and Cape Cod Bay	<50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas	H	H	H	L	L
Juveniles	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, Boston Harbor and Cape Cod Bay	<80		Bottom habitats, often smooth bottom near rocks or algae	H	H	H	L	L
Adults	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following	<110		Bottom habitats, dig depressions in	H	H	H	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, Boston Harbor and Cape Cod Bay			soft sediments which are then used by other species					
Spawning Adults	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, and Cape Cod Bay	<50	Late summer to early winter, peaks in Sept. and October	Bottom habitats with a hard bottom substrate, including artificial reefs and shipwrecks	H	H	H	L	L

Rationale: Ocean pout (Zoarces americanus) is a demersal species found in the western Atlantic from Labrador south to Cape Hatteras (Steimle et al. 1999e). It can occur in deeper waters south of Cape Hatteras, and has been found as deep as 363 m (Klein-MacPhee and Collette 2002a). It is found in most estuaries and embayments in the Gulf of Maine, and is caught in greatest abundance by the NEFSC trawl survey off southern New England (Steimle et al. 1999e).

Ocean pout eggs are laid in nests in crevices, on hard bottom or in holes and protected by the female parent for 2.5 to 3 months until they hatch (Klein-MacPhee and Collette 2002a). Potential impacts to habitat from otter trawls, scallop dredges and clam dredges include knocking down boulder piles, removing biogenic structure and filling in bottom depressions, which may disturb nests and/or leave these areas less suitable for nests. In addition, fishing may frighten parents from nests leaving eggs susceptible to predation. Egg EFH is therefore considered to have a high vulnerability to all bottom-tending mobile gear.

Ocean pout have a relatively short larval stage, and in fact some authors (Klein-MacPhee and Collette 2002a) suggest that there is no larval stage (Steimle et al. 1999e). Since the NEFMC designated EFH for this life stage, it is considered here. Larvae (hatchlings) remain near the nest site; however, there is little information on their use of habitats. Larvae do not appear to be as closely associated with the bottom as eggs or juveniles; however, it is anticipated that loss of structure may impact larvae to some degree. Larval EFH was determined to have high vulnerability to mobile bottom-tending gears.

Juvenile pout are found under rocks, shells and algae, in coastal waters and are closely associated with the bottom (Steimle et al. 1999e). They feed on benthic invertebrates such as gammarid amphipods and polychaetes. It is expected that loss of structure may be a fairly significant impact to juvenile EFH. Vulnerability of juvenile EFH to all mobile gear was considered to be high.

Adult pout are found in sand and gravel in winter and spring, and in rocky/hard substrate areas for spawning and nesting (Klein-MacPhee and Collette 2002a). They create burrows in soft sediments, and their diet consists mainly of benthic invertebrates including mollusks, crustaceans and echinoderms. Because of the strong benthic affinity of ocean pout, it is anticipated that vulnerability of adult EFH to all mobile gear is high.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 24 - Ocean Pout EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Outer continental shelf of GB and southern NE south to Cape Hatteras, North Carolina	<1250	Observed all year and primarily collected at depths from	Pelagic waters	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
			110 - 270m						
Larvae	Outer continental shelf of GB and southern NE south to Chesapeake Bay	<1250	Observed all year and primarily collected at depths from 70 - 130m	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	170-350		Bottom habitats	L	L	0	L	L
Adults	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	150 - 380		Bottom habitats	L	L	0	L	L
Spawning Adults	Outer continental shelf of GB and southern NE south to the Middle Atlantic Bight	330 - 550	Spawn throughout the year	Bottom habitats	L	L	0	L	L

Rationale: Offshore hake (Merluccius albidus), are distributed over the continental shelf and slope of the northwest Atlantic, ranging from the Grand Banks south to the Caribbean and Gulf of Mexico (Chang et al. 1999a, Klein-MacPhee 2002c). Juveniles and adults are found in deeper waters, and are most abundant at depths between 150 - 380 m. They are an important component in the slope community off Florida, and are reportedly caught near the outer edge of the Scotian shelf, and on the slopes of deep basins in the Gulf of Maine and the continental slope from the southeastern edge of Georges Bank south. Because of their depth preference, very little is known about the offshore component of the stock. Moreover, offshore hake are similar in appearance to silver hake, and may have been misidentified in earlier studies. They are taken commercially as by-catch in the silver hake fishery. No information is available on substrate preferences for juveniles and adults. Eggs and larvae are pelagic, and EFH vulnerability to fishing gears is not applicable.

Juvenile and adult offshore hake appear to feed at or near the bottom, and are primarily piscivorous (feeding particularly on clupeids, anchovies, and lanternfishes) but they also eat crustaceans and squid (Klein-MacPhee 2002c). There is evidence of adult diel vertical migration. Only limited information exists about this species, and none of it indicates that offshore hake have a very strong bottom affinity, or that impacts from fishing gear would affect the functional value of their habitat. Although spawning occurs near the bottom, the actual use of benthic habitat during spawning is unknown. The vulnerability of adult and juvenile EFH to otter trawls and scallop dredges is expected to be low. Vulnerability to clam dredges is rated as none since the gear does not operate in the EFH of this species.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 25 - Offshore Hake EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB and the following estuaries: Great Bay to Boston Harbor	30-270	October to June, peaks Nov. to Feb.	Pelagic waters	NA	NA	NA	NA	NA
Larvae	GOME, GB and the following estuaries: Passamaquoddy Bay, Sheepscot R., Great Bay to Cape Cod Bay	10-250	September to July, peaks Dec. to Feb.	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 - 250		Bottom habitats with aquatic vegetation or a substrate of sand, mud or rocks	L	L	L	L	L
Adults	GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15-365		Hard bottom habitats including artificial reefs	M	M	L	L	L
Spawning Adults	GOME, southern NE, and middle Atlantic south to New Jersey includes Mass Bay	15-365	September to April, peaks Dec. to Feb.	Bottom habitats with a substrate of hard, stony, or rocky bottom includes artificial reefs	M	M	L	L	L

Rationale: Pollock (Pollachius virens) range from the Hudson straits to North Carolina (Klein-MacPhee 2002b), and are most common on the Scotian Shelf, Georges Bank, the Great South Channel and Gulf of Maine (Cargnelli et al. 1999d). They segregate into schools by size, and avoid water warmer than about 15□C (Klein-MacPhee 2002b). They are active fish that live at any depth between the bottom and the surface, depending upon food supply. They are associated with coastal areas and offshore shoals, and are found from shore out to depths of about 325 m, but are most common from 75-175 m (Cargnelli et al. 1999d). Juveniles frequently occupy the rocky intertidal zone, which may serve as a nursery area (Klein-MacPhee 2002c). Neither adults nor juveniles are selective in substrate type.

Pollock are opportunistic, and the diet of both juveniles and adults consists mainly of euphausiid crustaceans, but fish, other crustaceans and squid are also eaten (Cargnelli et al. 1999d, Klein-MacPhee 2002c). Adults spawn over broken bottom and the slopes of offshore banks, and eggs are pelagic. Based on food habits, and the distribution and behavior of pollock, vulnerability of juvenile EFH to benthic mobile gear is characterized as low. Since pollock spawn on the bottom, the vulnerability of adult EFH to otter trawls and scallop dredges has been rated as moderate. EFH vulnerability from clam dredges has been rated as low for juveniles and adults since there is limited use of this gear in pollock EFH. Pollock eggs and larvae are pelagic, so EFH vulnerability to fishing gear is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 26 - Pollock EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras		May to November, peaks in June and July	Surface waters of inner continental shelf	NA	NA	NA	NA	NA
Larvae	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and following estuaries: Sheepscot R., Mass Bay to Cape Cod Bay; Buzzards Bay, Narragansett Bay & Hudson R./ Raritan Bay	<200	May to December, peaks in Sept. and Oct.	Surface waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, & Chesapeake Bay	<100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops	H	H	H	L	L
Adults	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan, Delaware Bay, & Chesapeake Bay	10-130		Bottom habitats in depressions with a substrate of sand and mud	M	M	L	L	L
Spawning Adults	GOME, southern edge of GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and following estuaries: Sheepscott R., Mass Bay, Cape Cod Bay, Buzzards Bay, & Narragansett Bay	<100	May to November, peaks in June and July	Bottom habitats in depressions with a substrate of sand and mud	M	M	L	L	L

Rationale: Red hake (Urophycis chuss) is a demersal species that ranges from southern Newfoundland to North Carolina, and is most abundant between Georges Bank and New Jersey (Steimle et al. 1999d). They occur at depths between 35 - 980 m, and are most common between 72 - 124 m (Klein-MacPhee 2002b). Larvae, juveniles, and adults have been found in estuaries from Maine south to Chesapeake Bay (NEFMC 1998). Eggs and larvae are pelagic, and EFH vulnerability to bottom-tending fishing gear is not applicable.

Juvenile red hake are found in live Atlantic sea scallops or empty scallop shells, and are also associated with other objects such as other shells, sponges, and rocks (Klein-MacPhee 2002b). Shelter appears to be a critical habitat requirement for this life stage (Able and Fahay 1998), and physical complexity, including biogenic structure other than scallop shells, may be important (Auster et al. 1991, 1995). Their diet consists mainly of amphipods and other infauna and epifauna. Juvenile hake EFH is considered to be highly vulnerable to all three mobile gear groups.

Adult red hake feed mainly on euphausiids, and also consume other invertebrates and fish (Klein-MacPhee 2002b). They are found mainly on

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL

soft bottoms (sand and mud) where they create depressions or use existing depressions. They are also found on shell beds, but not on open, sandy bottom. Otter trawls and scallop dredges operate in these soft bottom and shell bed areas and have been shown to affect the structural components of these habitats. Offshore in Maryland and northern Virginia, adult red hake are found on temperate reefs and hard bottom areas. There is a potential that otter trawls could operate in hard bottom areas and adversely affect the functional value of these reef habitats. Vulnerability of red hake EFH to otter trawls and scallop dredges is assessed as moderate. Clam dredges would not typically operate in these hard bottom areas, nor in the softer sediments with which red hake are usually associated in the northern extent of their range, but there is some overlap between adult EFH and clam dredge use in sandy habitats. EFH vulnerability to clam dredges is characterized as low.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.

Table 27 - Red Hake EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Viviparous (eggs are retained in mother, released as larvae)				NA	NA	NA	NA	NA
Larvae	GOME, southern GB	50-270	March to October, peak in August	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, southern edge of GB	25-400		Bottom habitats with a substrate of silt, mud, or hard bottom	H	H	0	L	L
Adults	GOME, southern edge of GB	50-350		Bottom habitats with a substrate of silt, mud, or hard bottom	M	M	0	L	L
Spawning Adults	GOME, southern edge of GB	5 - 350	April to August	Bottom habitats with a substrate of silt, mud, or hard bottom	M	M	0	L	L

Rationale: Redfish (Sebastes spp.) include both the Acadian redfish (Sebastes fasciatus) and the deepwater redfish (Sebastes mentella). These two species are difficult to discriminate at all life stages, hence they are usually combined (Pikanowski et al. 1999). Acadian redfish range from Iceland to New Jersey, and deepwater redfish occur from the Gulf of Maine north. Where the species overlap, the deepwater redfish occurs in deeper water. They range in depth from 25 - 592 m (Klein-MacPhee and Collette 2002b), with adults most common from 125 - 200 m and juveniles between 75 and 175 m (Pikanowski et al. 1999). In general, information about redfish is very limited. Females bear live young and larvae are pelagic, so habitat vulnerability is not applicable to eggs or larvae.

Redfish are found chiefly on silt, mud or hard bottom and rarely over sand (Pikanowski et al. 1999). On the Scotian shelf they are strongly associated with fine-grained clay/silt bottom (Klein-MacPhee and Collette 2002b), as well as deposits of gravel and boulders (Pikanowski et al.

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
1999). It is hypothesized that redfish do not prefer a particular bottom type, but may be more exposed to predation over a featureless bottom due to their sedentary nature. There is limited evidence that juveniles use anemones and boulders for cover (Pikanowski et al. 1999). Early demersal phase Acadian redfish have been observed to occur primarily in piled boulder habitats while late-juvenile redfish occur in both piled boulder, gravel and dense cerianthid anemone habitats (Auster et al., in prep.). Habitat vulnerability from otter trawls and scallop dredges in boulder habitats is high as gear can overturn boulders and reduce the number of crevices as well as dislodge cerianthid anemones from the bottom. Redfish are benthic during the day, and become more active at night when they rise off the bottom, following the vertical migration of their primary euphausiid prey (Pikanowski et al. 1999). They also eat some benthic fish. Adult EFH was determined to be moderately vulnerable to impacts from otter trawls and scallop dredges. Clam dredges do not operate in areas of redfish EFH so vulnerability was rated as none.									
Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**									

Table 28 - Redfish EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, southern NE and the following estuaries: Great Bay to Cape Cod Bay		August to September	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Mass Bay, to Cape Cod Bay		May in mid-Atlantic area, Aug. & Sept. in GOME, GB area	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Cape Cod Bay	5 - 225	May-September	Pelagic stage - pelagic waters; Demersal stage - Bottom habitat with seagrass beds or substrate of mud or fine-grained sand	M	M	0	L	L
Adults	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Cape Cod Bay	5 - 325		Bottom habitats with substrate of mud or fine-grained sand	L	L	0	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Spawning Adults	GOME, southern edge of GB, southern NE to middle Atlantic	5 - 325	April to May - southern part of range; August - Sept.- northern part of range	Bottom habitats with substrate of mud or fine-grained sand in deep water	L	L	0	L	L

Rationale: White hake (Urophycis tenuis) adults co-occur geographically with red hake, and their habits are similar, but white hake are distributed in a wider range of depths and temperatures (Chang et al. 1999c, Klein-MacPhee 2002b). They are found from Labrador south to North Carolina, and occasionally stray as far as Florida and Iceland. They inhabit coastal estuaries and occur across the continental shelf to the submarine canyons along the upper continental shelf, and in the basins of the Gulf of Maine. Adult distribution in the region is focused in the Gulf of Maine and along the southern slope of Georges Bank. All life stages are found in estuaries in the vicinity of the Gulf of Maine (NEFMC 1998).

Most pelagic juveniles cross the shelf and enter estuaries from Canada south to the Mid-Atlantic, although some may also settle to the bottom in as yet unknown shelf habitats (Klein-MacPhee 2002b). Demersal juveniles are found in nearshore waters out to a depth of about 225 m (Chang *et al.* 1999c). Eelgrass is an important habitat for juveniles, but its functional importance is unknown; this life stage is not necessarily dependent upon structure (Able and Fahay 1998). Young-of-the-year white hake feed mainly on shrimp, mysids and amphipods. Since otter trawls and scallop dredges can negatively impact eelgrass (Stephan *et al.* 2000) in estuaries, vulnerability of juvenile white hake EFH to these gears is characterized as moderate. Hydraulic clam dredges are not utilized in estuaries of the Gulf of Maine so vulnerability to this gear is rated as none.

Adults prefer benthic deposits of fine grained sediments (Chang et al. 1999c). They feed primarily on fish, cephalopods, and crustaceans. Since they are not benthivores and have not been documented to use benthic habitats for cover, EFH vulnerability to otter trawls and scallop dredges is characterized as low. Clam dredges are not operated in areas of adult EFH and vulnerability to this gear is rated as none.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 29 - White Hake EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Merrimack R. to Cape Cod Bay	50-150	All year, peaks June to October	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Mass Bay to Cape Cod Bay	50-130	All year, peaks July to September	Surface waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB, continental shelf off southern NE, middle	20-270		Bottom habitats of	M	M	M	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass Bay to Cape Cod Bay			all substrate types					
Adults	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass Bay to Cape Cod Bay	30-325		Bottom habitats of all substrate types	L	L	L	L	L
Spawning Adults	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Mass Bay and Cape Cod Bay	30-325		Bottom habitats of all substrate types	L	L	L	L	L

Rationale: Whiting or silver hake (Merluccius bilinearis) range from Newfoundland south to Cape Fear, NC, and are most common from Nova Scotia to New Jersey (Morse et al. 1999). They are distributed broadly, and are found from nearshore shallows out to a depth of 400 m (Klein-MacPhee 2002c). All life stages have been found in estuaries from Maine to Cape Cod Bay (Morse et al. 1999). The vertical movement of offshore hake is governed chiefly by their pursuit of prey; both juveniles and adults show a vertical migration off the bottom at night when feeding activity is greatest.

In the Mid-Atlantic Bight, juvenile whiting have been found in greater densities in areas with greater amphipod tube cover (Auster et al. 1997). Further, silver hake size distributions in sand wave habitats are positively correlated with sand wave period (i.e., the spacing between sand waves), suggesting energetic or prey capture benefits in particular sand wave environments (Auster et al in press). Juveniles are primarily found on silt or sand substrate and feed mainly on crustaceans, including copepods, amphipods, euphausiids, and decapods (Morse et al. 1999). The vulnerability of juvenile EFH to mobile gear was rated as moderate because of the potential connection between structure and habitat suitability for this life stage.

Adult whiting rest on the bottom in depressions by day, primarily over sand and pebble bottoms, and rarely in rockier areas. In the Mid-Atlantic, adults were found on flat sand, sand wave crests, shell, and biogenic depressions, but were most often found on flat sand. At night, adults feed on anchovies, herring, lanternfish, and other fishes (Klein-MacPhee 2002c). Piscivory increases with size for this species. Vulnerability of adult whiting EFH to the three mobile gear types was rated as low because of whiting=s piscivorous food habits and preference for higher energy sand environments which recover quickly from fishing gear impacts (see Section 5). Eggs and larvae of this species are pelagic, so habitat vulnerability to fishing gear is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 30 - Silver Hake EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to	<70	February to November, peaks May and October in	Surface waters	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	Delaware Inland Bays		middle Atlantic July - August on GB						
Larvae	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Delaware Inland Bays	<70	February to November, peaks May and October in middle Atlantic July - August on GB	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand	L	L	L	L	L
Adults	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand	L	L	L	L	L
Spawning Adults	GOME, GB, southern NE, middle Atlantic south to Virginia -NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass Bay to Delaware Inland Bays	1 - 75	February - December, peak in May in middle Atlantic	Bottom habitats with substrate of mud or fine grained sand	L	L	L	L	L

Rationale: Windowpane flounder (Scophthalmus aquosus) is distributed in coastal waters from the Gulf of St. Lawrence to Florida, and are most abundant on Georges Bank and in the New York Bight (Klein-MacPhee 2002d). Windowpane are abundant in estuaries from Maine through the Chesapeake Bay (NEFMC 1998). They are a shoal-water fish, with a depth range of up to 200 m, but are most abundant in waters less than 50 m deep. Both juveniles and adults are found on muddy sediments in the Gulf of Maine, and fine, sandy sediments on Georges Bank and in New England and the Mid-Atlantic Bight.

Mysids are the main prey item of juveniles (Klein-MacPhee 2002d). Adults have been shown to feed exclusively on nekton and show little need for bottom structure (Chang et al. 1999b). EFH vulnerability to the three types of mobile gear was rated as low for both these life stages. Windowpane eggs and larvae are pelagic, so EFH vulnerability to fishing gear is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 31 - Windowpane Flounder EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Delaware Inland Bays	<5	February to June, peak in April on GB	Bottom habitats with a substrate of sand, muddy sand, mud, and gravel	L	L	L	L	L
Larvae	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Delaware Inland Bays	<6	March to July, peak in April and May on GB	Pelagic and bottom waters	L	L	L	L	L
Juvenile s	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 - 10 (1 – 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand	L	L	L	L	L
Adults	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrate of mud, sand, gravel	M	M	M	L	L
Spawnin g Adults	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Delaware Inland Bays	<6	February to June	Bottom habitats including estuaries with substrate of mud, sand, gravel	M	M	M	L	L

Rationale: Winter flounder (Pseudopleuronectes americanus) range from Labrador to Georgia, and are most abundant from the Gulf of St. Lawrence to Chesapeake Bay (Klein-MacPhee 2002a). All lifestages are common in estuaries from Maine through Chesapeake Bay. Juveniles and adults are found in waters less than 100 m deep, and most are found from shore to 30 m. They range far upstream in estuaries, and have been found in freshwater.

Winter flounder lay demersal adhesive eggs in shallow water less than 5 m in depth, with the exception of spawning areas on Georges Bank and Nantucket shoals (Pereira et al. 1999). Substrates include sand, muddy sand, mud and gravel, with sand the most common. Although otter trawls, scallop dredges and clam dredges may affect the eggs directly, this was not considered a habitat impact. Since there is no indication that the eggs rely on any structure, egg EFH vulnerability to these three gears was rated as low. Since early stage larvae are associated with the bottom and are at times demersal (Able and Fahay 1998) larval EFH vulnerability to all gears were also rated as low instead of none.

Juvenile and adult winter flounder are found on mud and sand substrates, and adults are also seen on cobble, rocks and boulders (Pereira et al. 1999). Both life stages can be opportunistic feeders, however their main prey items are infaunal invertebrates. Because of their reliance on infauna and their ability to use alternative food supplies, EFH vulnerability to the three mobile gear types for these the adults stages was ranked as moderate.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year:

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL

OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 32 - Winter Flounder EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras	Deep	March to October	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras	Deep	March to November, peaks in May - July	Surface waters	NA	NA	NA	NA	NA
Juveniles	GOME, outer continental shelf from GB south to Cape Hatteras	50-450 to 1500		Bottom habitats with fine-grained substrate	M	L	0	L	L
Adults	GOME, outer continental shelf from GB south to Chesapeake Bay	25-300		Bottom habitats with fine-grained substrate	M	L	L	L	L
Spawning Adults	GOME, outer continental shelf from GB south to Chesapeake Bay	25-360	March to November, peaks in May-August	Bottom habitats with fine-grained substrate	M	L	L	L	L

Rationale: Witch flounder (Glyptocephalus cynoglossus) range from Newfoundland south to Cape Hatteras. In U.S. waters, this species is common throughout the Gulf of Maine, and is found in deeper areas of and adjacent to Georges Bank and along the continental shelf edge and upper slope (Cargnelli et al 1999e, Klein-MacPhee 2002a).

Juvenile and adult witch flounder are found mainly over fine muddy sand, or mud. Though their diet is comprised mainly of polychaetes, they feed on other invertebrates as well (Cargnelli et al. 1999e). Since these life stages occur in areas of lower natural disturbance and rely on infauna, EFH vulnerability to impacts from otter trawls were rated as moderate. Impacts from scallop dredging may be less severe, since scallop dredges are not usually used in muddy habitat; however, vessel trip reports indicated scallop dredging in areas of witch flounder EFH, therefore, vulnerability to scallop dredges was rates as low. Juvenile EFH vulnerability to clam dredges was rated as none since clam dredges are not used in mud or in water depths where juvenile witch flounder are primarily found. However, EFH vulnerability to clam dredges for adults was rated as low since clam dredges do operate in adult EFH. Eggs and larvae of witch flounder are pelagic, so vulnerability of EFH to fishing gear impacts is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 33 - Witch Flounder EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GB, Mass Bay, Cape Cod Bay, southern NE continental shelf south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Cape Cod Bay	30 - 90	Mid-March to July, peaks in April to June in southern NE	Surface waters	NA	NA	NA	NA	NA
Larvae	GB, Mass Bay, Cape Cod Bay, southern NE continental shelf, middle Atlantic south to Chesapeake Bay and the following estuaries: Passamaquoddy Bay to Cape Cod Bay	10 - 90	March to April in New York bight; May to July in south NE and southeastern GB	Surface waters	NA	NA	NA	NA	NA
Juveniles	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud	M	M	M	L	L
Adults	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud	M	M	M	L	L
Spawning Adults	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Mass Bay to Cape Cod Bay	10-125		Bottom habitats with substrate of sand or sand and mud	M	M	M	L	L

Rationale: Yellowtail flounder (Limanda ferruginea) are found from the Gulf of St. Lawrence south to the Chesapeake Bay (Klein-MacPhee 2002a, Johnson et al. 1999). They are most abundant on the western half of Georges Bank, western Gulf of Maine, east of Cape Cod, and off southern New England (Johnson et al. 1999). Their usual depth range is from 10 - 100 m (Klein MacPhee 2002a). Juveniles and adults are found in some New England estuaries while eggs and larvae are found more frequently in these habitats (NEFMC 1998). Yellowtail eggs and larvae are pelagic, so EFH vulnerability is not applicable.

Yellowtail flounder feed mainly on benthic macrofauna, primarily amphipods and polychaetes (Johnson et al. 1999). Adults eat mostly crustaceans while juveniles focus on polychaetes. Both life stages are found on substrates of sand or sand and mud. Vulnerability of juvenile and adult EFH to the three types of mobile gear was rated as moderate because of the potential affect of these gears on infaunal yellowtail prey.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0- No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 34 - Yellowtail Flounder EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Southern flank of GB and south the Cape Hatteras, NC	200-400		Attached to the underside of the female crab until hatched - see spawning adults	NA	NA	NA	NA	NA
Larvae	Southern flank of GB and south the Cape Hatteras, NC	200-1800	January - June	Water column from surface to seafloor	NA	NA	NA	NA	NA
Juveniles	Southern flank of GB and south the Cape Hatteras, NC	700-1800		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites	L	0	0	L	L
Adults	Southern flank of GB and south the Cape Hatteras, NC	200-1300		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites	L	0	0	L	L
Spawning Adults	Southern flank of GB and south the Cape Hatteras, NC	200-1300		Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites	L	0	0	L	L

Rationale: Red crab (Chaeceon (Geryon) quinquedens) are found on the outer continental shelf and slope of the western Atlantic from Nova Scotia into the Gulf of Mexico (Steimle et al. 2001). They are found on the bottom, chiefly between water depths of 200 and 1800. EFH depth range for juveniles is from 700 to 1800 m, and for adults EFH ranges from 200-1300 m. They are found on substrates ranging from silt and clay to hard substrates.

Red crab are opportunistic benthic feeders/scavengers, with a diet of epifauna and other opportunistically available items (Steimle et al. 2001). Post-larval juveniles feed on a wide variety of infaunal and epifaunal benthic invertebrates. Small crabs eat sponges, hydroids, gastropods and other organisms. Larger crabs eat similar small benthic fauna and larger prey including demersal and mid-water fishes.

The only fishery using mobile bottom gear which operates in red crab EFH is the monkfish trawl fishery (NEFMC 2002). The vulnerability of adult and juvenile red crab EFH to otter trawls was characterized as low because of their opportunistic feeding habits. Vulnerability to scallop dredges and clam dredges was rated as none since those gears do not operate in red crab EFH. Larval red crabs are pelagic and EFH vulnerability is not applicable. The "habitat" for eggs is the female carapace, therefore EFH vulnerability for this life stage is also not applicable.

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 35 - Red Crab EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Continental shelf from Maine through Cape Hatteras, NC also includes estuaries from Great Bay to Cape Cod Bay; Buzzards Bay to Long Island Sound; Gardiners Bay and Great South Bay	0 - 15		Pelagic waters	NA	NA	NA	NA	NA
Larvae	Continental shelf from GOME through Cape Hatteras, NC also includes estuaries from Great Bay to Cape Cod Bay; Narragansett Bay to Long Island Sound; Gardiners Bay and Great South Bay	10-130		Pelagic waters	NA	NA	NA	NA	NA
Juveniles	Continental shelf from GOME through Cape Hatteras, NC also includes estuaries from Passamaquoddy Bay; Penobscot Bay to Saco Bay; Great Bay; Mass Bay to Cape Cod Bay; Narragansett Bay, Long Island Bay; Gardiners Bay to Hudson R./ Raritan Bay	0 - 320		Pelagic waters	NA	NA	NA	NA	NA
Adults	Continental shelf from GOME through Cape Hatteras, NC also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass Bay to Long Island Bay; Gardiners Bay to Hudson R./ Raritan Bay	0 - 380		Pelagic waters	NA	NA	NA	NA	NA

Rationale: All life stages of Atlantic mackerel (Scomber scombrus) are pelagic, so their EFH is not vulnerable to bottom tending fishing gear, and vulnerability was categorized as Anot applicable.@

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 36 - Atlantic Mackerel EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Continental shelf and estuaries from southern NE to North Carolina, also includes Buzzards Bay	0 - 200	May to October	Water column of coastal Mid-Atlantic Bight and Buzzards Bay	NA	NA	NA	NA	NA
Larvae	Pelagic waters over continental shelf from GOME to Cape Hatteras, NC, also includes Buzzards Bay	<100	May - November, peak June - July	Habitats for transforming (to juveniles) larvae are near coastal areas and into marine parts of estuaries between Virginia and NY; when larvae become demersal, found on structured inshore habitat such as sponge beds	H	H	H	L	L
Juveniles	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound and James River	1 - 38	Found in coastal areas (April – Dec. , peak June – Nov.) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas, offshore clam beds and shell patches may be used during wintering	H	H	H	L	L
Adults	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound and James	20-50	Wintering adults (Nov. to April) offshore, south of NY to NC; inshore, estuaries from May to	Structured habitats (natural & man-made) sand and shell substrates preferred	H	H	H	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	River		October						

Rationale: Black sea bass (Centropristis striata) are found in coastal waters of the northwest Atlantic, from Cape Cod south to Cape Canaveral (Klein-MacPhee 2002e). Occasionally they stray as far north as the Bay of Fundy (Gulf of Maine). Juveniles are common in high salinity estuaries. Adults and juveniles are found in estuaries from Massachusetts south to the James River, VA (Stone et al. 1994).

Black sea bass larvae are pelagic, but then become demersal and occupy structured inshore habitat such as sponge beds, eelgrass beds, shellfish beds, shell patches, and other rough bottoms (Steimle et al. 1999a) and offshore shell patches including clam beds (Able and Fahay 1998). The availability of structure limits successful postlarval and/or juvenile recruitment (Steimle et al. 1999a). Juveniles are diurnal visual predators that feed on benthic invertebrates and small fish. Adults are also structure oriented, and thought to use structure as shelter during day- time, but may stray off it to hunt at night.

Each of these life stages is associated with structure that may be vulnerable to fishing gear impacts, so vulnerability was rated as high for all mobile gear. It is important to note that structured habitats comprised of wrecks or other artificial reefs prone to damage by mobile gear may be avoided by fishermen. This is true of high relief natural areas as well. Black sea bass eggs are pelagic, so vulnerability to EFH is not applicable. Although larvae are pelagic, they do become demersal as they transition into juveniles. Therefore, larvae were rated the same as juveniles.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 37 - Black Sea Bass EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	North of Cape Hatteras, found over continental shelf from Montauk Point, NY south to Cape Hatteras, South of Cape Hatteras, found over Continental shelf through Key West, Florida	Mid-shelf depths	April to August	Pelagic waters	NA	NA	NA	NA	NA
Larvae	North of Cape Hatteras, found over continental shelf from Montauk Point, NY south to Cape Hatteras, South of Cape Hatteras, found over continental shelf through Key West, Florida, the slope sea and Gulf Stream between latitudes 29N and 40N; includes the following estuaries: Narragansett Bay	>15	April to September	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	North of Cape Hatteras, found over continental shelf from Nantucket Island, MA south to Cape Hatteras, South of Cape Hatteras, found over		North Atlantic estuaries from June to October, Mid-Atlantic	Pelagic waters	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	Continental shelf through Key West, Florida, the slope sea and Gulf Stream between latitudes 29N and 40N also includes estuaries between Penobscot Bay to Great Bay; Mass Bay to James R.; Albemarle Sound to St. Johns River, FL		estuaries from May toOctober, South Atlantic estuaries from March to December						
Adults	North of Cape Hatteras, found over continental shelf from Cape Cod Bay, MA south to Cape Hatteras, South of Cape Hatteras, found over Continental shelf through Key West, Florida also includes estuaries between Penobscot Bay to Great Bay; Mass Bay to James R.; Albemarle Sound to Pamilco/ Pungo R., Bougue Sound, Cape Fear R., St. Helena Sound, Broad R., St. Johns R., & Indian R.		North Atlantic estuaries from June to October, Mid-Atlantic estuaries from April to October, South Atlantic estuaries from May to January	Pelagic waters	NA	NA	NA	NA	NA

Rationale: All life stages of bluefish (Pomatomus saltatrix) are pelagic, so their EFH is not vulnerable to bottom tending fishing gear, and vulnerability was not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 38 - Bluefish EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Over continental shelf from GOME through Cape Hatteras, NC, also in estuaries from Mass Bay to Long Island Sound; Gardiners Bay, Great South Bay, and Chesapeake Bay	0-1829	Spring and summer	Pelagic waters	NA	NA	NA	NA	NA
Larvae	Over continental shelf from GOME through Cape Hatteras, NC, also in estuaries from Boston Harbor, Waquoit Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Chesapeake Bay	10-1829	Summer and fall	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	Over continental shelf from GOME through Cape Hatteras, NC also in estuaries from Mass Bay, Cape Cod Bay to Delaware Inland Bays; Chesapeake Bay, York R. and James R.	10-365 (most <120)	Winter – shelf, spring to fall - estuaries	Pelagic waters (larger individuals found over sandy and muddy substrates)	NA	NA	NA	NA	NA
Adults	Over continental shelf from GOME through Cape Hatteras, NC, also in estuaries from Mass Bay, Cape Cod Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; York R. and James R.	10-365 (most <120)	Winter – shelf, summer to fall - estuaries	Pelagic waters (schools form over sandy, sandy-silt and muddy substrates)	NA	NA	NA	NA	NA

Rationale: All life stages of butterfish (Peprilus triacanthus) are pelagic, so their EFH is not vulnerable to bottom tending fishing gear, and vulnerability was not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0- No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 39 - Butterfish EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Over continental shelf from GOME through Cape Hatteras, NC	0 - 182	Carried northward by Gulf Stream	Pelagic waters	NA	NA	NA	NA	NA
Adults	Over continental shelf from GOME through Cape Hatteras, NC	0 - 182	Late fall - offshore, spawn Dec. - March	Pelagic waters	NA	NA	NA	NA	NA

Rationale: All stages of Ilex squid (Illex illecebrosus) are pelagic, so their EFH is not vulnerable to bottom tending fishing gear, and vulnerability was not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 40 - Illex Squid EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs***	Over continental shelf from GOME through Cape Hatteras, NC	<50	Spawn in May, hatch in July	Demersal egg masses are commonly found on sandy/mud bottom, usually attached to rocks/boulders, pilings or algae such as Fucus, Ulva, Laminaria, and Porphyra	H	H	H	L	L
Juveniles	Over continental shelf from GOME through Cape Hatteras, NC	0 - 213	Spring - fall - inshore winter - offshore	Pelagic waters	NA	NA	NA	NA	NA
Adults	Over continental shelf from GOME through Cape Hatteras, NC	0 - 305	March – Oct. – inshore, winter - offshore	Pelagic waters	NA	NA	NA	NA	NA

Rationale: Loligo or longfin squid (Loligo pealeii) is a pelagic schooling species. It is distributed in continental shelf and slope waters from Newfoundland to the Gulf of Venezuela (Cargnelli et al. 1999a). Most life stages of loligo squid are pelagic; however, encapsulated eggs are laid in masses, called Amops@ which are attached to structures such as rocks and algae on substrates of sand, mud, or hard bottom (Cargnelli et al. 1999a). ***As of this writing, EFH is not designated for Loligo eggs, however it will be designated in the near future. Once Loligo egg EFH is designated its EFH will be rated as highly vulnerable to otter trawls and scallop dredges, particularly since biogenic structures are used as attachment sites.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 41 - Loligo Squid EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Eastern edge of GB and GOME throughout the Atlantic EEZ	8-245		Throughout substrate to a depth of 3ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras	L	L	L	L	L
Adults	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Spawn May-Dec. with several peaks	Throughout substrate to a depth of 3ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras	L	L	L	L	L

Rationale: Ocean quahog (Arctica islandica) juveniles are found in offshore sandy substrate, and may survive in muddy intertidal areas (Cargnelli et al. 1999b). Adults are found in similar offshore habitats, just below the surface of the sediment, usually in medium to fine-grained sand. Although clam dredges remove clams from the sediment, the habitat's functional value is probably not affected. Juvenile and adult EFH vulnerability was therefore rated as low for all mobile gears. Ocean quahog eggs and larvae are pelagic, therefore EFH vulnerability is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0- No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 42 - Ocean Quahog EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 -60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud	L	L	L	L	L
Adults	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 -60, low density beyond 38	Spawn-summer to fall	Throughout substrate to a depth of 3 ft within federal waters	L	L	L	L	L

Rationale: Atlantic surfclams (Spisula solidissima) are found in sandy continental shelf habitats from the southern Gulf of St. Lawrence to Cape Hatteras, North Carolina (Cargnelli et al. 1999c). They burrow into substrates from fine to coarse sandy gravel and are not found in mud. Although clam dredges remove clams from the sediment, the habitat's functional value is probably not affected. Juvenile and adult EFH vulnerability was therefore rated as low for all mobile gears. Surfclam eggs and larvae are pelagic, therefore EFH vulnerability is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 43 - Atlantic Surfclam EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Southern NE to coastal Virginia includes the following estuaries: Waquoit Bay to Long Island Sound; Gardiners Bay, Hudson R./ Raritan Bay	(<30)	May - August	Pelagic waters in estuaries	NA	NA	NA	NA	NA
Larvae	Southern NE to coastal Virginia includes the following estuaries: Waquoit Bay to Long Island Sound; Gardiners Bay, Hudson R./ Raritan Bay	(<20)	May - September	Pelagic waters in estuaries	NA	NA	NA	NA	NA
Juveniles	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; & Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and Inshore on various sands, mud, mussel, and eelgrass bed type substrates	M	M	M	L	L
Adults	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay & Inland Bays; & Chesapeake Bay	(2 - 185)	Wintering adults (November - April) are usually offshore, south of NY to NC	demersal waters north of Cape Hatteras and Inshore estuaries (various substrate types)	L	L	L	L	L

Rationale: Scup (Stenotomus chrysops) is a temperate species that occurs primarily from Massachusetts to South Carolina, although it has been reported as far north as the Bay of Fundy and Sable Island Bank, Canada (Steimle et al. 1999f). Scup are primarily benthic feeders that use a variety of habitat types. Juveniles forage on epibenthic amphipods, other small crustaceans, polychaetes, mollusks, fish eggs, and larvae. They occur over a variety of substrates, and are most abundant in areas without structure. Limited observations of scup have shown periodic use of seafloor depressions for cover (Auster et al. 1991, 1995).

Adults are found on soft bottoms or near structures. During the summer they are closer inshore and found on a wider range of habitats. In the winter they congregate offshore in areas that are expected to serve as a thermal refuge (Klein-McPhee 2002f), particularly deeper waters of the outer continental shelf and around canyon heads. Smaller adults feed on echinoderms, annelids, and small crustaceans. Larger scup consume more squids and fishes. Since juvenile scup are primarily benthic feeders, their EFH was rated as moderately vulnerable to impacts from mobile bottom gear. EFH for adults was rated as low since there is less of a reliance on benthic prey items.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 44 - Scup EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	GOME through Cape Hatteras, NC across the Continental shelf; Continental shelf waters South of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquaddy Bay to Saco Bay; Mass Bay & Cape Cod Bay	10-390		Continental shelf waters and estuaries	L	L	L	L	L
Adults	GOME through Cape Hatteras, NC across the Continental shelf; Continental shelf waters South of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquaddy Bay to Saco Bay; Mass Bay & Cape Cod Bay	10-450		Continental shelf waters and estuaries	L	L	L	L	L

Rationale: Spiny dogfish (Squalus acanthias) is a coastal shark with a circumboreal distribution and is one of the most abundant sharks in the western North Atlantic (McMillan and Morse 1999). Female dogfish are viviparous, so EFH designations were limited to juveniles and adults. Smaller dogfish have been reported to feed primarily on crustaceans, with an increase in piscivory in larger individuals (Burgess 2002). Fish, mainly schooling pelagic species, constitute 50% of their diet. Their voracious and opportunistic feeding behavior was emphasized by McMillan and Morse (1999). Since neither of these life stages appears to be closely tied to benthic organisms, the vulnerability of their EFH to mobile gears was rated as low.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 45 - Spiny Dogfish EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	Over continental shelf from GOME to Cape Hatteras, NC; South of Cape Hatteras to Florida	30-70 fall; 110 winter; 9-30 spring	October to May	Pelagic waters, heaviest concentrations within 9 miles of shore off NJ and NY	NA	NA	NA	NA	NA
Larvae	Over continental shelf from GOME to Cape Hatteras, NC; South of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to Narragansett Bay; Hudson River/ Raritan Bay; Barnegat Bay, Chesapeake Bay, Rappahannock R., York R.,	10-70	Mid-Atlantic Bight from Sept. to Feb.; southern part from Nov. to May at depths of	Pelagic waters, larvae most abundant 19 - 83 km from shore, southern areas 12 - 52 miles from	NA	NA	NA	NA	NA

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
	James R., Albemarle Sound, Pamlico Sound, Neuse R. to Indian R.		9-30 m	shore					
Juveniles	Over continental shelf from GOME to Cape Hatteras, NC; South of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5-5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds	M* * L	L	L	0	0
Adults	Over continental shelf from GOME to Cape Hatteras, NC; South of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., & Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150m in colder months	Demersal waters and estuaries	M** L	L	L	0	0

Rationale: Summer flounder (Paralichthys dentatus) occur in the shallow estuarine waters and outer continental shelf from Nova Scotia to Florida with the center of their range located in the Middle Atlantic Bight (Packer et al. 1999b). Juvenile summer flounder are opportunistic feeders, and their diet includes mysids, fish, and some crustaceans (Packer et al. 1999b). There are gradual changes in the diet of summer flounder, with fish becoming more important as a food source as individuals get older and larger. Adults are also opportunistic feeders, with fish and crustaceans making up a significant portion of their diet.

Eelgrass and macroalgae has been designated as a habitat area of particular concern (HAPC) for adult and juvenile summer flounder. Stephan et al. (2000) determined that otter trawls could result in below-ground impacts to submerged aquatic vegetation (SAV), which, of all the impacts to SAV possible from fishing gear, was ranked as the impact of greatest concern. This determination was qualified by an acknowledgment that factors relevant to trawl use and the type of SAV species present, must be considered for a more precise evaluation of the effects of this gear type in SAV habitat. * *Based on potential impacts to SAV, the vulnerability of the summer flounder HAPC to otter trawls is rated as moderate. Vulnerability to scallop or clam dredges was considered low since these gears are not typically used in estuaries where SAV is found.

Since adults and juveniles are both opportunistic feeders, their EFH vulnerability (aside from the HAPC) was rated as low for all bottom tending gear. Summer flounder eggs and larvae are pelagic so EFH vulnerability is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 46 - Summer Flounder EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	US-Canadian Boundary to VA/NC boundary (shelf break; GB to Cape Hatteras)	76-365	Serial spawning March - November; peaks April – October	Water column	NA	NA	NA	NA	NA
Larvae	US-Canadian Boundary to VA/NC boundary (outer continental shelf - GB to Cape Hatteras)	76-365	Feb. - Oct; peaks July – October	Water column	NA	NA	NA	NA	NA
Juveniles	US-Canadian Boundary to VA/NC boundary (shelf break, submarine canyon walls and flanks - GB to Cape Hatteras)	76-365	All year - may leave GB in winter	Rough bottom, small burrows, and sheltered areas – Substrate rocky, stiff clay, human debris	H	L	0	L	L
Adults	US-Canadian Boundary to VA/NC boundary (shelf break, submarine canyon walls and flanks - GB to Cape Hatteras)	76-365	All year - may leave GB in winter	Rough bottom, small burrows, and sheltered areas – Substrate rocky, stiff clay, human debris	H	L	0	L	L

Rationale: Tilefish (Lopholatilus chamaeleontieps) are restricted to the continental shelf break south of the Gulf of Maine (Steimle et al. 1999b). They occupy a number of habitats, including scour basins around rocks or other rough bottom areas that form burrow-like cavities, and pueblo habitats in clay substrate. The dominant habitat type is a vertical burrow in a substrate of semi-hard silt/clay, 2 - 3 m deep and 4 - 5 m in diameter with a funnel shape. These burrows are excavated by tilefish, and then secondary burrows are created by other organisms, including lobsters, conger eels, and galatheid crabs. Tilefish are visual daytime feeders on galatheid crabs, mollusks, shrimps, polychaetes and occasionally fish. Mollusks and echinoderms are more important to smaller tilefish. Little is known about juveniles of the species.

A report to the Mid-Atlantic Fishery Management Council (Able and Muzeni 2002) from a video survey in areas of tilefish habitat identified trawl tracks through these areas, and concluded that trawling caused a re-suspension of bottom sediments. The report noted that re-suspended sediments fill burrows in and/or cause physiological stress to tilefish that are present. No obvious structural impacts to the habitat were identified. However, due to the tilefish's reliance on structured shelter and the need for further study, the vulnerability of tilefish EFH to otter trawls was ranked as high. Clam dredges operate in shallow, sandy waters typically uninhabited by tilefish, so EFH vulnerability was rated as none for this gear. Scallop vessel monitoring data (Section 4) indicate that scallop dredges operate to a small extent in areas overlapping tilefish EFH, therefore EFH vulnerability to scallop dredges was ranked as low. Tilefish eggs and larvae are pelagic, therefore EFH vulnerability is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 47 - Tilefish EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Larvae	Along the Atlantic coast from Virginia through the Florida Keys	<50		Estuarine wetlands especially important (flooded saltmarshes, brackish marsh, tidal creeks, mangrove fringe, seagrasses)	NA	NA	NA	NA	NA
Juveniles	Along the Atlantic coast from Virginia through the Florida Keys	<50	Found throughout Chesapeake Bay from Sept. - Nov.	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars and front beaches	L	0	0	L	L
Adults	Along the Atlantic coast from Virginia through the Florida Keys	<50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast – shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs	L	L	L	L	L

Rationale: Red drum (Sciaenops ocellatus) are distributed in estuarine and coastal waters depending upon their stage of maturity (McGurrin 1994). Juvenile red drum are found in shallow estuarine backwaters and as they grow they move to deeper areas. Submerged aquatic vegetation is particularly important habitat for juvenile drum. Sub-adult and adult red drum are found on estuarine bay bottoms or oyster reefs, and in nearshore coastal waters including the beach zone out to several miles from shore.

Juvenile and adult red drum have a varied diet. Smaller juveniles eat copepods and mysids, while larger individuals eat decapods (crabs & shrimp), fish and plant material (McGurrin 1994). Although SAV is an important habitat for juvenile red drum, EFH vulnerability to otter trawls was rated as low since its use in SAV is limited. Scallop dredges and hydraulic clam dredges usually are not used in juvenile red drum EFH, therefore, EFH vulnerability for these gears was rated as none. Since red drum feed on a variety of organisms, and adults are found in many habitat types, vulnerability of adult EFH to mobile bottom gear was rated as low. Red drum eggs and larvae are pelagic therefore, EFH vulnerability is not applicable.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 48 - Red Drum EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Spanish Mackerel All Life Stages	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island ocean-side waters from surf zone to shelf break but from the Gulf Stream shoreward	NA	NA	NA	NA	NA
Cobia All Life Stages	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island ocean side waters from surf zone to shelf break but from the Gulf Stream shoreward, also high salinity bays, estuaries, seagrass habitat	NA	NA	NA	NA	NA
King Mackerel All Life Stages	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island ocean-side waters from surf zone to shelf break but from the Gulf Stream shoreward	NA	NA	NA	NA	NA
Rationale: All life stages of Spanish mackerel (Scomberomorus maculatus), cobia (Rachycentron canadum) and King mackerel (Scomberomorus cavalla) are pelagic, so their EFH is not vulnerable to bottom tending fishing gear, and vulnerability was not applicable.									
Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**									

Table 49 - Spanish Mackerel, Cobia, and King Mackerel EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
All Life Stages	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290-570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat	L	0	0	L	L

Rationale: Golden crab (Chaceon fenneri) inhabit the continental slope of Bermuda and the southeastern United States from Chesapeake Bay south through the Florida Straight and into the Gulf of Mexico (SAFMC 1998). Although similar to red crab, less is known about this species. They are categorized as opportunistic scavengers, and are found in depths from 290 - 570 m on substrates of foraminiferon ooze, dead coral mounds, and deep ripple habitat, dunes, and black pebble habitat. Scallop dredges and clam dredges do not operate in golden crab EFH due to depth so EFH vulnerability was rated as none. Most otter trawling operates in depths less than 200 m so EFH vulnerability was rated as low for this gear type.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 50 - Golden Crab EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occur-rence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Eastern GOME, GB, SNE, MAB to Hudson Canyon	0-750 mostly <150		Bottom habitats with mud, gravel, and sand substrates	M	M	L	L	L
Adults	Eastern GOME, GB, SNE, MAB to Hudson Canyon	0-750 mostly <150		Bottom habitats with mud, gravel, and sand substrates	M	M	L	L	L

Rationale: Barndoor skate (Dipturus laevis) occur from Newfoundland south to Cape Hatteras, but are most abundant on Georges Bank and in the Gulf of Maine. They are found on soft mud, sand and gravel. (Packer et al. in press (a)). Barndoor skate feed on invertebrates usually associated with the bottom - including polychaetes, gastropods, and bivalves - squid and fish. Smaller individuals feed primarily on polychaetes, copepods and amphipods while larger individuals capture larger and more active prey (McEachran 2002, Packer et al. in press (a)). A single fertilized egg is encapsulated in a leathery capsule known as a Amermaids purse.@ The young hatch in late spring or early summer and are thought to be about 180-190 mm in length, although very little information is available on this life stage (Packer et al. in press(a)).

Juvenile EFH was considered to be moderately vulnerable to otter trawls and scallop dredges because of the closer association of juveniles to a benthic invertebrate diet. Adult EFH vulnerability to otter trawls and scallop dredges was rated as moderate due primarily to their reproductive habits. EFH vulnerability to clam dredges was rated as low for juveniles and adults because this gear is not extensively used in EFH.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 51 - Barndoor Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 - 500 mostly <111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom	M	M	M	L	L
Adults	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 - 500 mostly <111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or	M	M	M	L	L

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
				gravelly bottom					

Rationale: Clearnose skate (Raja eglanteria) occur in the Gulf of Maine, but are most abundant from Cape Hatteras north to Delaware Bay. They are found over soft bottoms of mud and sand, and also occur on rocky or gravelly bottoms. They have been captured from shore out to depths of 330 m, but are most abundant at depths less than 111 m. (Packer et al. in press (b)). Adults and juveniles feed on polychaetes, amphipods, decapod crustaceans, mollusks, and fish. Like barndoor skates, crabs and benthic invertebrates are more important for smaller, younger individuals, and the importance of fish in the diet increases with age (McEachran 2002; Packer et al. in press(b)). A single fertilized egg is encapsulated in a leathery case. Eggs are deposited in the spring or summer and hatch 3 months later.

Juvenile EFH was considered to be moderately vulnerable to otter trawls, scallop dredges and clam dredges because of the closer association of juveniles to a benthic invertebrate diet. Adult EFH vulnerability to otter trawls, scallop dredges and clam dredges was rated as moderate due primarily to their reproductive habits.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 52 - Clearnose Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GB through MAB to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	<27		Bottom habitats with sandy substrate	L	L	L	L	L
Juveniles	GB through MAB to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-137 mostly 73-91		Bottom habitats with sandy or gravelly substrate or mud	M	M	M	L	L
Adults	GB through MAB to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-137 mostly 73-91		Bottom habitats with sandy or gravelly substrate or mud	M	M	M	L	L

Rationale: Little skate (Leucoraja erinacea) range from Nova Scotia to Cape Hatteras, and are most abundant on Georges Bank and in coastal waters south to the mouth of Chesapeake Bay. They have been found at depths up to 500 m, but are most common at depths less than 111 m. In southern New England, juveniles and adults have been associated with microhabitat features including biogenic depressions and flat sand during the day (Auster et al. 1991, 1995). They are generally found on sandy or gravelly bottoms, but also occur on mud. They co-occur with winter skate, and are more active at night, although they appear to feed throughout the day and night. The most important prey are amphipods and decapod crustaceans, followed by polychaetes. Prey items of minor importance include bivalves, isopods, and fish. Similar to barndoor and clearnose skates, the use of fish as a food source increases with increasing size. Smaller skates eat more amphipods, and larger skate consume more decapod crustaceans (Packer et al. in press (c)).

A single fertilized egg is encapsulated in a leathery case which is deposited on sandy substrate. The cases have sticky filaments that adhere to bottom substrates. In one study, eggs deposited in the late spring and early summer required five to six months to hatch. Other studies have shown incubation to exceed one year. When the young hatch, they are considered juveniles and are fully developed, measuring from 93-102 mm in total length (Packer et al. in press (c)).

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL

Vulnerability of juvenile EFH to mobile bottom gear was characterized as moderate because of the species dependence on benthic organisms in its diet. Vulnerability of adult EFH to mobile bottom gear was characterized as moderate due to its reproductive habits. Little skate is the only skate species in which EFH has been designated for eggs. Although bottom tending mobile gear may have adverse effects upon the eggs themselves, this was not considered to be a habitat impact. Since the bottom substrate appears to provide an attachment point for the eggs the EFH vulnerability to mobile gear was rated as low instead of none.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 53 - Little Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530 mostly 74-274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze	M	M	M	L	L
Adults	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530 mostly 74-274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze	M	M	M	L	L

Rationale: Rosette skate (Leucoraja garmani virginica) is a deeper water species that occurs along the outer shelf and continental slope from Nantucket Shoals to the Dry Tortugas, Florida. North of Cape Hatteras, it is most abundant in the southern section of the Chesapeake Bight. It occurs on soft bottoms, including sand and mud, at depths from 33-530 m, and is most common between 74 and 274 m. Juveniles tend to be found between 100 - 140 m. Major prey items include polychaetes, copepods, cumaceans, amphipods, Crangon, crabs, squid, octopods, and small fishes. A single fertilized egg is encapsulated in a leathery case. Egg cases are found in mature females most frequently in the summer (Packer et al. in press (d)).

Information on rosette skate is very limited. Because of the limited information available, the apparent dependence of the juveniles of this species on benthic organisms in its diet, and the reproductive habits of the adults, EFH vulnerability to mobile bottom gear was characterized as moderate.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 54 - Rosette Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Offshore banks of GOME	31-874 mostly 110-457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles	M	M	0	L	L
Adults	Offshore banks of GOME	31-874 mostly 110-457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles	H	H	0	L	L

Rationale: Smooth skate (Malacoraja senta) center of abundance is the Gulf of Maine. It occurs along the Atlantic coast from the Gulf of St. Lawrence south to South Carolina, at depths between 31-874 m. It is most abundant between 110-457 m. Analysis of NEFSC trawl survey data found juvenile skate most abundant between depths of 100-300 m during the time period from 1963-69. Smooth skate are found mostly over soft mud and clay of the Gulf of Maine=s deepwater basins, but also over the Gulf=s off shore banks with substrates of sand, shell, and/or gravel (Packer et al. in press (e)).

The diet of smooth skate is generally limited to epifaunal crustaceans, with decapod shrimp and euphausids as the most common prey, followed by amphipods and mysids. The diet shifts from amphipods and mysids to decapods as smooth skate grow (Packer et al. in press (e)). The diet of smooth skate is more restricted than other skate species (McEachran 2002).

The vulnerability of juvenile smooth skate EFH to otter trawls and scallop dredges was characterized as moderate because of the dietary habits of this species. The vulnerability of adult EFH was rated as high for otter trawls and scallop dredges because of the benthic diet as well as the reproductive habits of the species. Vulnerability to clam dredges was considered to be none for juveniles and adults since this gear is not used in the Gulf of Maine.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 55 - Smooth Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	GOME and GB	18-2000 mostly 111-366		Bottom habitats with a substrate of sand gravel, broken shell, pebbles, and soft mud	M	M	0	L	L
Adults	GOME and GB	18-2000 mostly 111-366		Bottom habitats with a substrate of sand gravel, broken shell, pebbles, and soft mud	M	M	0	L	L

Rationale: Thorny skate (Amblyraja radiata) range from Greenland south to South Carolina. In the Northeast region, it is most commonly seen in the Gulf of Maine and on the Northeast Peak and northern Great South Channel of Georges Bank. It is one of the most common skates in the Gulf of Maine, and occurs over a wide variety of bottom substrates, from sand, gravel, and broken shell to mud. It is found at depths ranging from 18 - 1200 m, and is reported to be most common between 50-350 m. A single fertilized egg is encapsulated in an egg case. Females with fully formed egg cases have been captured year round, though the percentage of mature females with egg cases is higher in the summer (Packer et al. in press (f)).

The primary prey of thorny skates are polychaetes and decapods, followed by amphipods and euphausiids. Fish and mysids are also consumed in lesser quantities. According to a survey from Nova Scotia to Cape Hatteras, thorny skate prey varies with skate size. Skates less than 40 cm total length feed mostly on amphipods, skates greater than 40 cm fed on polychaetes and decapods, and fishes were a major dietary component for skates larger than 70 cm. In general, with increasing size, mysids decreased in the diet while fishes increased (Packer et al. in press (f)).

Since juvenile thorny skate appear to be more reliant on benthic invertebrates, vulnerability of EFH to otter trawls and scallop dredges for this life stage was characterized as moderate. For adults, EFH vulnerability to otter trawls and scallop dredges was characterized as moderate because of their reproductive habits. EFH vulnerability to clam dredges was rated as none for juveniles and adults since there is no overlap between thorny skate EFH and areas in which clam dredges are used.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 56 - Thorny Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Juveniles	Cape Cod Bay, GB, SNE shelf through MAB to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-371 mostly <111		Bottom habitats with substrate of sand and gravel or mud	M	M	M	L	L
Adults	Cape Cod Bay, GB, SNE shelf through MAB to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-371 mostly <111		Bottom habitats with substrate of sand and gravel or mud	M	M	M	L	L

Rationale: Winter skate (Leucoraja ocellata) are found from Newfoundland south to Cape Hatteras. They are most abundant on Georges Bank and in coastal waters south to the mouth of the Hudson River. They are found over substrates of sand, gravel, and mud, in depths from shore out to 371 m, and are most common in less than 111 m of water. A single fertilized egg is encapsulated in a leather case and deposited on the bottom during summer in the northern portion of the range. Deposition has been reported to extend through January off southern New England. Young are fully developed at hatching (Packer et al. 1999g).

Polychaetes and amphipods are the most important prey items, followed by decapods, isopods, bivalves, and fish. In general, crustaceans make up over 50% of the diet for skate smaller than 61 cm, and fish and bivalves are a major component of the diet for skates larger than 79 cm. Crustaceans declined in importance with increasing skate size while polychaetes increased, until skates reached 81 cm.

Since juvenile winter skate appear to be more reliant on benthic invertebrates, vulnerability of EFH to mobile gear for this life stage was characterized as moderate. For adults, EFH vulnerability to mobile gear was characterized as moderate because of their reproductive habits.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 - No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Table 57 - Winter Skate EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

1.5.3 Vulnerability Analysis – Methodology and Matrix

A simple matrix (Table 58) was developed for each benthic life stage for each species to determine the vulnerability of its EFH to effects from bottom tending mobile gear. Six criteria were qualitatively evaluated for each life stage based upon existing information. Each evaluation consisted of a score based upon a predefined threshold. The first three criteria were related to habitat function and included shelter, food and reproduction. Scores for these criteria were determined as follows:

Shelter: (Scored from 0-2) If the lifestage has no dependence upon bottom habitat to provide shelter then a 0 was selected. Almost every lifestage evaluated has some dependence upon the bottom for shelter so 0 was seldom used with the exception of a few egg lifestages. If the lifestage has some dependence upon unstructured or non-complex habitat for shelter it was scored a 1. For example, flatfishes that rely primarily on cryptic coloration for predator avoidance or small scale sand waves for refuge were scored a 1. If the lifestage has a strong reliance on complex habitats for shelter it was scored a 2. For example, species such as juvenile cod and haddock that are heavily reliant on structure or complex habitat for predator avoidance were scored a 2.

Food: (Scored from 0-2) If the lifestage has no dependence on benthic prey it was scored a 0. For example, eggs were always scored a 0 as were lifestages that fed exclusively in the plankton. If the lifestage utilizes benthic prey for part of its diet but not exclusively a benthic feeder it was scored a 1. For example, species feeding opportunistically on crabs as well as squid or fish were scored a 1. If the lifestage feeds exclusively on benthic organisms and cannot change its mode of feeding it was scored a 2.

Reproduction: (Scored from 0-1) If the species has no dependence upon bottom habitats for spawning or its lifestage was not a reproductive stage it was scored a 0. For example, species that spawn in the water column were scored a 0 as well as juveniles of all species. If the species has some dependence upon bottom habitats for spawning it was scored a 1. For example, species that spawn on or over the bottom were scored a 1. This criteria was the most difficult to assess since there is limited knowledge on spawning behaviors for many species.

Habitat Sensitivity: (Scored from 0-2) This criterion no longer evaluates the function of the habitat for the species but looks at its overall sensitivity to disturbances in a relative fashion. The habitat needed by the species was based primarily upon its EFH designation. If a habitat was not considered sensitive to disturbance it was scored a 0. However, a score of 0 was not used for any benthic habitat type. If the habitat was considered to have a low sensitivity it was scored a 1. For example, habitats that are typically characterized as high energy environments without structural complexity or have rapid recovery rates they were scored a 1 (e.g. high energy sand environments). If the habitat type was considered highly sensitive it was scored a 2. For example, habitats that are characterized as structurally complex (such as habitats supporting epibenthic communities, boulder pile fields, etc.) or have very slow recovery rates (such as low energy deepwater environments) were scored a 2. These scores were based upon the existing conceptual models that show a direct relationship between structural complexity of the habitat and recovery time with increasing vulnerability.

Habitat Rank: The habitat rank was determined quantitatively as the sum of the previous scores (shelter + food + reproduction + habitat sensitivity). Another way to characterize the habitat rank is the relative vulnerability of the habitat to non-natural physical disturbance. The rank could range from 0-7, with 7 being the most vulnerable.

Gear Distribution: (Scored from 0-2) This criterion factors in the use of a particular gear type (otter trawl, scallop dredge, hydraulic clam dredge) in EFH for a particular lifestage. If the gear is not used in the described EFH it was scored a 0. If the gear operates in only a small portion of the described EFH it was scored a 1. If the gear operates in more than a small amount of the described EFH it was scored a 2. Distribution was determined as the qualitative overlap of EFH on the Vessel Trip Report location data which has been described in previous sections of this report.

Gear Rank: The gear rank provides the vulnerability of EFH to a particular gear type and was calculated as the product of the Habitat Rank x Gear Distribution. Based upon natural breaks in the rankings frequency distribution the following interpretations of the ranking have be made: 0 = no vulnerability to the gear or "none". This could only be attained if the gear was not used in the habitat (gear distribution = 0). 1 - 6 = low vulnerability to the gear. This generally occurred where the gear has minimal overlap with EFH (gear distribution = 1) and Habitat Rank was less than 7. Additionally, low vulnerability could be in habitats with high gear overlap (gear distribution = 2) but where Habitat Rank was low (3 or less). 7 - 9 = moderate vulnerability to the gear. This typically occurred where gear overlap with EFH was high (gear distribution = 2) and habitat rank was 4 or, overlap with EFH was low (gear distribution = 1) and Habitat Rank was 7. 10 - 14 = high vulnerability to the gear. This occurred only if the gear overlap with EFH was high (gear distribution = 2) and the habitat rank was 5 or more.

Species	Shelter	Food	Repro	Habitat Sensitivity	Habitat Rank	OT Dist.	SD Dist.	CD Dist.	OT Rank	SD Rank	CD Rank	OT Vuln.	SD Vuln.	CD Vuln.
American Plaice (A)	1	2	1	1	5	2	2	0	10	10	0	High	High	None
American Plaice (J)	1	2	0	1	4	2	2	0	8	8	0	Mod	Mod	None
Atlantic Cod (A)	1	1	0	2	4	2	2	1	8	8	4	Mod	Mod	Low
Atlantic Cod (J)	2	1	0	2	5	2	2	0	10	10	0	High	High	None
Atlantic Halibut (A)	1	1	1	1	4	2	2	0	8	8	0	Mod	Mod	None
Atlantic Halibut (J)	1	2	0	1	4	2	2	0	8	8	0	Mod	Mod	None
Atlantic Herring (E)	0	0	1	1	2	2	2	0	4	4	0	Low	Low	None
Atlantic Herring (SA)	0	0	1	1	2	2	2	0	4	4	0	Low	Low	None
Atlantic Scallops (A)	1	0	1	1	3	2	2	2	6	6	6	Low	Low	Low
Atlantic Scallops (J)	2	0	0	1	3	2	2	2	6	6	6	Low	Low	Low
Barndoor Skate (A)	1	1	1	1	4	2	2	1	8	8	4	Mod	Mod	Low
Barndoor Skate (J)	1	2	0	1	4	2	2	1	8	8	4	Mod	Mod	Low
Black Sea Bass (A)	2	1	0	2	5	2	2	2	10	10	10	High	High	High
Black Sea Bass (J)	2	1	0	2	5	2	2	2	10	10	10	High	High	High
Clearnose Skate (A)	1	1	1	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Clearnose Skate (J)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Haddock (A)	1	2	0	2	5	2	2	1	10	10	5	High	High	Low
Haddock (J)	2	2	0	2	6	2	2	1	12	12	6	High	High	Low
Little Skate (A)	1	1	1	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Little Skate (E)	0	0	1	1	2	2	2	2	4	4	4	Low	Low	Low
Little Skate (J)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Monkfish (A)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Monkfish (J)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Ocean Pout (A)	2	2	1	2	7	2	2	2	14	14	14	High	High	High
Ocean Pout (E)	2	0	1	2	5	2	2	2	10	10	10	High	High	High

Species	Shelter	Food	Repro	Habitat Sensitivity	Habitat Rank	OT Dist.	SD Dist.	CD Dist.	OT Rank	SD Rank	CD Rank	OT Vuln.	SD Vuln.	CD Vuln.
Ocean Pout (L)	2	0	1	2	5	2	2	2	10	10	10	High	High	High
Ocean Pout (J)	2	2	0	2	6	2	2	2	12	12	12	High	High	High
Ocean Quahog (A)	1	0	1	1	3	2	2	2	6	6	6	Low	Low	Low
Ocean Quahog (J)	1	0	0	1	2	2	2	2	4	4	4	Low	Low	Low
Offshore Hake (A)	1	1	0	1	3	2	1	0	6	3	0	Low	Low	None
Offshore Hake (J)	1	1	0	1	3	2	1	0	6	3	0	Low	Low	None
Pollock (A)	1	1	1	1	4	2	2	1	8	8	4	Mod	Mod	Low
Pollock (J)	1	1	0	1	3	2	2	1	6	6	3	Low	Low	Low
Red Crab (A)	1	1	1	2	5	1	0	0	5	0	0	Low	None	None
Red Crab (J)	1	1	0	2	4	1	0	0	4	0	0	Low	None	None
Red Hake (A)	1	2	0	1	4	2	2	1	8	8	4	Mod	Mod	Low
Red Hake (J)	2	2	0	2	6	2	2	2	12	12	12	High	High	High
Redfish (A)	1	1	0	2	4	2	2	0	8	8	0	Mod	Mod	None
Redfish (J)	2	1	0	2	5	2	2	0	10	10	0	High	High	None
Rosette Skate (A)	1	1	1	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Rosette Skate (J)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Scup (A)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Scup (J)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Silver Hake (A)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Silver Hake (J)	1	1	0	2	4	2	2	2	8	8	8	Mod	Mod	Mod
Smooth Skate (A)	1	2	1	1	5	2	2	0	10	10	0	High	High	None
Smooth Skate (J)	1	2	0	1	4	2	2	0	8	8	0	Mod	Mod	None
Spiny Dogfish (A)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Spiny Dogfish (J)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Summer Flound. (A)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Summer Flound. (J)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Surfclam (A)	1	0	1	1	3	2	2	2	6	6	6	Low	Low	Low
Surfclam (J)	1	0	0	1	2	2	2	2	4	4	4	Low	Low	Low
Thorny Skate (A)	1	1	1	1	4	2	2	0	8	8	0	Mod	Mod	None
Thorny Skate (J)	1	2	0	1	4	2	2	0	8	8	0	Mod	Mod	None
Tilefish (A)	2	2	0	1	5	2	1	0	10	5	0	High	Low	None
Tilefish (J)	2	2	0	1	5	2	1	0	10	5	0	High	Low	None
White Hake (A)	1	1	0	1	3	2	2	0	6	6	0	Low	Low	None
White Hake (J)	1	2	0	1	4	2	2	0	8	8	0	Mod	Mod	None
Windowpane Fl (A)	1	0	0	1	2	2	2	2	4	4	4	Low	Low	Low
Windowpane Fl (J)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Winter Flounder (A)	1	1	1	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Winter Flounder (E)	0	0	1	1	2	2	2	2	4	4	4	Low	Low	Low
Winter Flounder (J)	1	1	0	1	3	2	2	2	6	6	6	Low	Low	Low
Winter Skate (J)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Winter Skate(A)	1	1	1	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Witch Flounder (A)	1	2	0	1	4	2	1	1	8	4	4	Mod	Low	Low
Witch Flounder (J)	1	2	0	1	4	2	1	0	8	4	0	Mod	Low	None
Yellowtail Flound (A)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod
Yellowtail Flound (J)	1	2	0	1	4	2	2	2	8	8	8	Mod	Mod	Mod

Table 58-EFH Vulnerability Matrix Analysis

2.0 Statement of Council Concurrence

The Council concurs with the conclusions reached by the Gear Effects Workshop and reviewed by in this document concerning the description of effects on benthic habitat and determinations of adverse effects of fishing on EFH by gears used in the multispecies fishery in the Northeastern U.S.

3.0 Potential Adverse Impacts of Bottom Trawls and Dredges

Section 1.4 of this document describes the general effects of trawls and dredges on benthic marine habitats, as reported in three recent reports (ICES 2000, Johnson (2002), and NRC (2002). (The report by Morgan and Chuenpagdee was not available when this summary was written: it generally confirms the findings of the other three reports). All four of these reports are international or national in scope and include information on the effects of types of trawls and dredges not used in the Northeast region of the U.S. (e.g., beam trawls and toothed scallop dredges) and affected habitats not found in the NE region (e.g, coral reefs and maerl beds). The conclusions reached are, nevertheless, pertinent to an evaluation of potential adverse impacts of the types of trawls and dredges used in this region. To re-iterate, the four major types of habitat modification caused by bottom trawls that are identified in the ICES (2001) report are the following:

1. Loss or dispersal of physical features such as peak banks or boulder reefs (<u>changes are always permanent</u> and lead to an overall change in habitat diversity, which can in turn lead to the local loss of species and species assemblages dependant on such features);

2. Loss of structure-forming organisms such as bryozoans, tube-dwelling polychaetes, hydroids, seapens, sponges, mussel beds, and oyster beds (<u>changes may be permanent</u> and can lead to an overall change in habitat diversity which can in turn lead to the local loss of species and species assemblages dependant on such biogenic features);

3. Reduction in complexity caused by redistributing and mixing of surface sediments and the degradation of habitat and biogenic features, leading to a decease in the physical patchiness of the sea floor (<u>changes are not likely to be permanent</u>);

4. Alteration of the detailed physical features of the sea floor by reshaping seabed features such as sand ripples and damaging burrows and associated structures which provide important habitats for smaller animals and can be used by fish to reduce their energy requirements (<u>changes are not likely to be permanent</u>).

The NRC (2002) report also identified three major effects of trawling and dredging, the first two of which are also mentioned in the ICES (2001) report:

1. Reduced habitat complexity;
2. Discernible changes in benthic communities (caused by repeated trawling and dredging);
3. Reduced productivity of benthic habitats.

The four effects of trawling identified in the ICES (2001) report are listed in order of decreasing permanence. Given the MSA definition of "adverse" as "more than minimal and not temporary," the first effect is clearly adverse. The second effect may be permanent and the other two are not likely to be permanent. However, they are still considered as potential adverse impacts since they are effects that could persist in certain habitats that are exposed to more or less continual, or frequently repeated, trawling activity. Furthermore, given the similarity in the habitat effects of dredges and trawls noted in the NRC (2002) and Morgan and Chuenpagdee (2003) reports, all of these potential adverse effects are considered to apply equally well to both gear types.

Looking at the effects of bottom trawls and scallop dredges in the NE region, there is more specific information to evaluate. According to the October 2001 workshop report (NREFHSC 2002), otter trawls had greater overall impacts than scallop dredges, but affected physical and biological structure equally. Effects on biological structure scored higher than effects on physical structure for both gears. In addition, trawls were judged to have some effects on major physical features.

Additional information is provided in this report on the recovery times for each type of impact for all three gears in mud, sand, and gravel habitats ("gravel" includes other hard-bottom habitats). This information makes it possible to rank these three substrates in terms of their vulnerability to the effects of bottom trawling and dredging, bearing in mind that other factors such as frequency of disturbance from fishing and from natural events are also important. Otter trawls and scallop dredges were assigned higher impact scores in gravel, mud ranked second for trawls (and sand third), and sand ranked second for scallop dredges (this gear is not used in mud habitats).

Effects of trawls on major physical features in mud (deep-water clay-bottom habitats) and gravel bottom were described as permanent, and impacts to biological and physical structure were given recovery times of months to years in mud and gravel. Impacts of trawling on physical structure in sand were of shorter duration (days to months) given the exposure of most continental shelf sand habitats to strong bottom currents and/or frequent storms.

For scallop dredges in gravel, recovery from impacts to biological structure was estimated to take several years and, for impacts to physical structure, months to years. In sand, biological structure was estimated to recover within months to years and physical structure within days to months.

Results of a comprehensive review of available gear effect publications that were relevant to the NE region of the U.S. are summarized in Section 1.4. Positive and negative effects of otter trawls and scallop dredges are listed by substrate type in Table 59 through Table 62 along with recovery times (when known). Without more information on recovery times, it is difficult to be certain which of the negative effects listed in these tables last for, say, more than a month or two. In fact, it is difficult to conclude in some cases (e.g., furrows produced by trawl doors) whether the habitat effect is positive, negative, or just neutral. Despite these shortcomings in the information, the scientific literature for the NE region does provide some detailed results that confirm the previous determinations of potential adverse impacts of trawls and dredges that were based on the ICES (2001), NRC (2002), and Morgan and Chuenpagdee (2003) reports.

Physical Effects	Recovery
Doors produce furrows/berms	2-18 months
Repeated tows increase bottom roughness	
Re-suspension/dispersal of fine sediments	
Rollers compress sediments	
Smoothing of surface features	
Biological Effects	
Reduced infaunal abundance	Within 3 ½ months (1 of 2 studies)
Reduced number of infaunal species	Within 3 ½ months
Reduced abundance of polychaete/bivalve species	Within 3 ½ months (1 of 2 studies)
Increased food value of sediments	
Increased chlorophyll production of surface sediments	
Removal/damage of epifauna	
Reduced abundance of brittlestars	
Increased number of infaunal species	
Increased abundance of polychaetes	
Decreased abundance of bivalves	
Altered community structure	18 months

Table 59– Effects and Recovery Times of Bottom Otter Trawls on Mud Substrate in the Northeast Region as Noted By Authors of Eight Gear Effect Studies.

Physical Effects	Recovery
Doors produce furrows/berms	Few days – a year
Smoothing of surface features	Within a year
Re-suspension/dispersal of fine sediments	No lasting effects
Biological Effects	
Mortality of large sedentary and/or immobile epifaunal species	
Reduced density of attached macrobenthos	
Removal/damage of epifauna	
Reduced abundance of polychaetes	
Reduced abundance/biomass of epibenthic organisms	
Reduced biomass/average size of many epibenthic species	
Epifauna (sponges/anemones) less abundant in closed areas	

Table 60- Effects and Recovery Times of Bottom Otter Trawls on Sand Substrate in the Northeast Region as Noted By Authors of Twelve Gear Effect Studies.

Physical Effects	Recovery
Displaced boulders	
Removal of mud covering boulders and rocks	
Groundgear leave furrows	
Biological Effects	
Reduced abundance of attached organisms (sponges, anemones, soft corals)	
Damaged sponges, soft corals, brittle stars	12 months

Table 61– Effects and Recovery Times of Bottom Otter Trawls on Gravel and Rock Substrate in the Northeast Region as Noted By Authors of Three Gear Effect Studies.

Physical Effects	Recovery
Disturbed physical/biogenic structures	
Loss of fine surficial sediments	More than 6 months
Reduced food quality of sediments	Within 6 months
Biological Effects	
Reduction in total number of infaunal individuals	Within 6 months
Reduced abundance of some species (polychaetes/amphipods)	
Decreased densities of two megafaunal species	

Table 62– Effects and Recovery Times of Chain Sweep Scallop Dredges on Sand Substrate in the Northeast Region as Noted By Authors of Three Gear Effect Studies.

Given the evidence that there are potential adverse impacts of trawls on hard-bottom, sand, and mud habitats, of scallop dredges on hard-bottom and sand habitats in the NE region, the next step is to relate the intensity of fishing activity with each of these gear types to the distribution of these three substrates in the region. This comparison is over-simplified because it does not take into account other factors such as depth and the degree of natural disturbance, the quality of the sediment distribution is limited, and fishing activity is quantified by ten minute squares (TMS) of latitude and longitude. However, it generally indicates where within the region the adverse impacts of these three gears are concentrated.

The analysis in Section 1.3 indicates that the ten-minute-squares (TMS) that account for most of the bottom trawling in the region overlay a high percentage (>40%) of five different sediment types (Figure 5), even though most of the TMS are associated with sand since sand is the primary sediment type in the region. The results show that dredging is more closely related to sand (and less to the other sediment types) than trawling. Bottom trawling during 1995-2001 was almost equally divided between the Gulf of Maine, Georges Bank, southern New England, and the Mid-Atlantic sub-regions, whereas scallop dredging was more concentrated in the Mid-Atlantic (Figure 6). A significant amount of scallop dredging also took place on Georges Bank. The frequency of scallop dredge activity increased relative to the amount of each sediment type present, with sediment grain size on Georges Bank and in the Mid-Atlantic (Figure 10).

The following conclusions can therefore be reached:

- Adverse and potentially adverse habitat impacts from bottom trawling occur throughout most of the NE region on a variety of substrates;
- Adverse and potentially adverse habitat impacts from scallop dredging occur primarily in the Mid-Atlantic and secondarily on Georges Bank on sand, gravelly sand, and gravel substrates;

Based on these conclusions, bottom trawls are determined to have the largest adverse impact to benthic habitats in the NE region because they are used on more days at sea than dredges, and therefore affect a larger area of bottom, and because they affect a variety of substrates over a large area. It must be noted, however, that there is a large variety of bottom otter trawls that are designed to be used in specific bottom conditions to catch certain species, and that some of them affect benthic habitats more so than others. This conclusion therefore refers to bottom otter trawls in a generic sense. Scallop dredges (specifically, New Bedford style chain sweep dredges) rank second because their adverse effects are limited to sand and gravel substrates (not mud).

3.1.1 Cumulative Impacts of All Three Gears

Because the potential adverse impacts of trawls and dredges are so similar bottom otter trawls and scallop dredges can be considered together and their cumulative effects as a function of the fishing activity of both gears added together. In state waters, which are designated as EFH for one or more species in the multi-species assemblage, the cumulative effects of mobile, bottom-tending gear would also include adverse impacts from other types of dredges listed in Table 2. The combined effect of otter trawls and scallop dredges was ranked considerably higher in gravel (and other hard-bottom habitats) than in sand (ranked second) and mud (ranked third)) (NREFHSC 2002). Impacts on biological structure were considered to be more severe than impacts on physical structure, with removal of major physical features ranking third). A fourth effect, changes in benthic prey, was not adequately evaluated because there was not enough information available. Combined impacts to gravel and sand habitat were primarily to biological structure, with gravel ranking higher than sand. Impacts on physical structure were judged to be the same in gravel and sand. Impacts in mud ranked low, with removal of major physical structures scoring higher than impacts to physical and biological structure.

3.1.2 Species/Life Stages With Vulnerable EFH

A final step in the process of assessing the potential adverse impacts that was taken for this amendment is the determination of which of the 39 federally-managed species in the Northeast region have EFH which is vulnerable to the adverse impacts of otter trawls and scallop dredges. This evaluation was conducted by examining known life history information for each benthic life stage of these species that describes how habitat features such as three-dimensional structure and prey populations are affected by fishing activities for each gear type. Twenty-four species were determined to have EFH for at least one life stage that was moderately or highly vulnerable to the adverse effects of mobile, bottom-tending gear. Thirteen of the 15 species that are included in the multi-species assemblage were included in the list. Species and life stages that are not listed are adult and juvenile offshore hake, juvenile pollock, adult silver hake and white hake, juvenile winter flounder, and adult and juvenile windowpane. Assessments of habitat management measures that are intended to minimize the adverse impacts of fishing in this amendment/EIS should focus on the species and life stages.

The Council concurs with the EFH vulnerability determinations and has determined the following:

Notes: E = eggs lifestage, L = larvae lifestage, J = juvenile lifestage, and A = adult lifestage

Otter Trawls

The use of Otter Trawls may have an adverse effect on the following species (and life stages) EFH as designated in Amendment 11 to the Northeast Multispecies FMP (1998):

American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), Atlantic sea scallops (J), haddock (J, A), ocean pout (E, L, J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), red crab (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Scallop Dredge (New Bedford style)

The use of New Bedford style Scallop Dredges may have an adverse effect on the following species (and life stages) EFH as designated in Amendment 11 to the Northeast Multispecies FMP (1998):

American plaice (J, A), Atlantic cod (J, A), Atlantic halibut (J, A), Atlantic sea scallops (J), haddock (J, A), ocean pout (E, L, J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (J, A), yellowtail flounder (J, A), black sea bass , (J, A), scup (J), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Gillnets were not found to have adverse effects the Essential Fish Habitat as currently designated in this region.

Species	Otter Trawl Vulnerability	Scallop Dredge Vulnerability
American Plaice (A)	High	High
American Plaice (J)	Mod	Mod
Atlantic Cod (A)	Mod	Mod
Atlantic Cod (J)	High	High
Atlantic Halibut (A)	Mod	Mod
Atlantic Halibut (J)	Mod	Mod
Barndoor Skate (A)	Mod	Mod
Barndoor Skate (J)	Mod	Mod
Black Sea Bass (A)	High	High
Black Sea Bass (J)	High	High
Clearnose Skate (A)	Mod	Mod
Clearnose Skate (J)	Mod	Mod
Haddock (A)	High	High
Haddock (J)	High	High
Little Skate (A)	Mod	Mod
Little Skate (J)	Mod	Mod
Ocean Pout (A)	High	High
Ocean Pout (E)	High	High
Ocean Pout (L)	High	High

Species	Otter Trawl Vulnerability	Scallop Dredge Vulnerability
Ocean Pout (J)	High	High
Pollock (A)	Mod	Mod
Red Hake (A)	Mod	Mod
Red Hake (J)	High	High
Redfish (A)	Mod	Mod
Redfish (J)	High	High
Rosette Skate (A)	Mod	Mod
Rosette Skate (J)	Mod	Mod
Scup (J)	Mod	Mod
Silver Hake (J)	Mod	Mod
Smooth Skate (A)	High	High
Smooth Skate (J)	Mod	Mod
Thorny Skate (A)	Mod	Mod
Thorny Skate (J)	Mod	Mod
Tilefish (A)	High	Low
Tilefish (J)	High	Low
White Hake (J)	Mod	Mod
Winter Flounder (A)	Mod	Mod
Winter Skate (J)	Mod	Mod
Winter Skate(A)	Mod	Mod
Witch Flounder (A)	Mod	Low
Witch Flounder (J)	Mod	Low
Yellowtail Flound (A)	Mod	Mod
Yellowtail Flound (J)	Mod	Mod

Table 63 – Summary of Adversely Affected EFH (Species and Life Stages) by the Monkfish fishery.

APPENDIX III
Monkfish FMP Amendment 2

DSEIS Public Comment and Response
(rev. 12/9/04)

This appendix presents all public hearing summaries as well as written comments received by the Councils, and NOAA Fisheries on Amendment 2, including comments received during the DSEIS comment period, May 1-July 28, 2004, as well as late comments, and the Councils' response. Several of the comments received by the Councils during this period did not specifically address the alternatives under consideration but spoke more generally to issues or concerns with the monkfish FMP, or raised issues more appropriate to public scoping and amendment development. The Councils could not address those comments after publication of the DSEIS without delaying the amendment beyond the court-ordered deadline for publication of the FSEIS, January 14, 2005, however, the response to comments in this appendix addresses those issues.

This appendix contains the following sections:

1. Summary of all comments received and the Councils' response.
2. Summary of Amendment 2 Public Hearings
3. Summary table of written comments received by NEFMC during DSEIS comment period, May 1 – July 28, 2004
4. Written comment received during DSEIS comment period, including representative sample and count of generic comment letters received by NEFMC and NOAA Fisheries
5. Late comment, letters and emails received after the close of the public comment period

Comments and Response

1. *Comment:* The Councils received nearly unanimous comment opposing the preferred alternative under Decision 1, to separate DAS usage requirements. Commenters were concerned about the impact of increased effort on monkfish rebuilding, on groundfish stocks (as a result of "freed up" DAS), and on the trip limits and DAS that could be allocated to currently active vessels in response to the overall increase in monkfish effort.

   Response: The Councils rejected the preferred alternative and are proposing taking no action on this measure.

2. *Comment:* On Decisions 1a – 1d, related to elements of the preferred alternative in Decision 1, the Councils received a relatively small number of comments (one to five on each) that were split between the alternatives under consideration. Many of the commenters qualified their statements by noting that they were made in case the Councils adopted Alternative 1, Decision 1, but that they did not support Alternative 1 to start with. The exception was under Decision 1d, regarding programs to allow the transfer of monkfish DAS, which received support among the small number of individuals who commented.

   Response: Since the Councils did not adopt Alternative 1, Decision 1, these decisions do not apply. The Councils did, however, decide to include transferable DAS as an item that could be taken up at a future time under the framework adjustment procedure.

3. *Comment:* Most of the individuals that commented on adjustments to the incidental catch limit (Decisions 2-5) supported the preferred alternatives, although two supported a maximum of 500 lbs. under Decision 2 because it would reduce regulatory discards.

   Response: The Councils adopted the preferred alternatives in these decisions. They did not adopt the 500 lb. maximum incidental catch under Decision 2 because they felt that the total discards on the limited number of vessels involved under this rejected alternative, compared to the preferred alternative, was not sufficiently large to warrant the higher limit, considering enforcement concerns and the potential incentive to target monkfish under the higher limit.

4. *Comment:* Four individuals commented that the minimum fish size should not be reduced, and two said that it should be increased. Several individuals supported the uniform minimum size at 11 inches.

   Response: The Councils adopted a uniform minimum fish size of 11 inches primarily to improve enforcement and reduce regulatory discards. The action will also reduce FMP complexity, consistent with Amendment 2 Goal VII. Furthermore, the Councils' decision to not eliminate the minimum size, as recommended by the PDT, confirms the original basis for the minimum size rule, that is, to discourage targeting of small fish and increasing yield per recruit.

5. *Comment:* The Councils received a small number of comments evenly split on the alternatives being considered to change or eliminate the closed season (Decision 7).

   Response: The Councils considered PDT comments that there is no apparent biological benefit from a 20-day-out requirement, and that even if the period were extended, any benefits to spawning would not be realized as long as other fishing can occur where monkfish is caught incidentally.

6. *Comment:* Two individuals commented in support of taking no action to allow an exemption from FMP rules for vessels fishing in the NAFO Regulated Area, while one supported the exemption.

   Response: The Councils adopted the exemption because it is consistent with a similar exemption in the Multispecies FMP, it is not likely to have any negative biological impacts and provides an opportunity for vessels that may otherwise be facing severe restrictions in domestic fisheries while not impacting the monkfish rebuilding plan.

7. *Comment:* The Councils received a large number of comments in support of the proposals to implement deep-sea canyon closures (Decision 11, Alternatives 5AB and 5C). Many of these comments, approximately 5,000, were form letters submitted electronically, while several conservation organizations submitted individual letters supporting the alternatives. In many cases, commenters supported Alternative 5C, but stated that if the Councils did not adopt that alternative they should adopt Alternative 5AB. Following the NEFMC's decision to adopt Alternative 5AB, one organization that had supported Alternative 5C submitted a revised comment letter to the MAFMC supporting the NEFMC's decision. The Councils also received comments from several fishing industry organizations supporting the idea of protecting deep-sea coral habitats, but urging the Councils to base any action on sound scientific information about the presence of corals and the impacts of all types of fishing on those habitats.

   Response: The Councils adopted Alternative 5AB, on the grounds that the two affected canyons are the ones where deep-sea corals are known to be present. The Councils also adopted a 6-inch maximum roller diameter for trawl vessels on a monkfish DAS in the southern management area which will effectively prevent those vessels from fishing in other areas where corals may be present. The NEFMC has also indicated that they intend to consider additional action under the Habitat Omnibus Amendment under development to more comprehensively address the issue of protecting deep-sea corals.

8. *Comment:* Two conservation organizations commented that the DSEIS failed to include adequate measures to minimize bycatch or bycatch mortality, and to require a standardized bycatch reporting methodology as required by the Magnuson Stevens Act.

   Response: The proposed action includes four measures that directly or indirectly reduce regulatory discards and other bycatch. Specifically, the amendment adjusts the incidental catch limit in several fisheries, reduces the minimum fish size in the southern area, closes areas of known deep-water coral concentrations to vessels on a monkfish DAS, and promotes cooperative research (including research into bycatch reduction strategies). The latter item has and indirect effect of reducing bycatch because such an effect depends on the successful research, development and implementation of bycatch reduction strategies. To facilitate such implementation, the Councils added bycatch reduction measures to the list of actions that can be taken under the framework adjustment procedure, thereby minimizing the time needed to adopt such regulations. The Councils also considered other alternatives that would have had the effect of reducing bycatch, but did not adopt them for the reasons discussed in Section 4.2. In regards to bycatch monitoring, the Councils acknowledge that NMFS is approaching the bycatch issue on a national level versus on a fishery-by-fishery basis, and, thus, determined that is not appropriate or practicable to implement a significantly new or expanded reporting methodology focused just on the monkfish fishery through this amendment. Therefore, no additional specific bycatch monitoring alternatives are being recommended in Amendment 2, however, the Councils recommend that further observer coverage aimed specifically at the monkfish fishery be established at a level sufficient to characterize the amount and type of bycatch in this fishery consistent with NMFS' development of bycatch monitoring strategies.

9. *Comment:* The Environmental Protection Agency made 6 comments on the DSEIS, summarized as follows:

   1. The FSEIS should address whether any new issues/concerns of the public were raised between the end of the scoping period and publication of the DSEIS.
   2. EPA recommends that the FSEIS include a discussion on how NMFS determined which environmental resources would be impacted, and suggests that marine water quality, subsistence harvesting, environmental justice communities and air quality could also be impacted.
   3. EPA recommends a separate section describing the Environmental Justice communities that could be adversely impacted by the proposed actions, and the method for making that determination.
   4. The FSEIS should explain how the proposed decoupling of DAS is mitigation. This comment is under the heading of "experimental trawl".
   5. The FSEIS should state whether the proposed canyon closures will be implemented at the same time as other provisions of the amendment, or require separate rulemaking, and, if so, what the impacts of that is relative to the

environmental impacts of the proposed action.

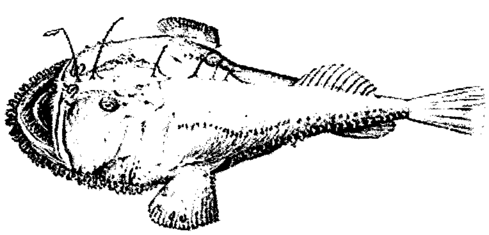
Response: Section 8.1.2, "Scoping", of the FSEIS was revised to include discussion of issues raised following the end of the scoping period and how they are addressed in the proposed action. Section 6.6.1, "Background, Cumulative Effects" was revised to include a basis for the selection of the valued environmental components and why air quality, marine water quality and subsistence fishing are not considered in the analysis of impacts. Additionally, a section discussing Environmental Justice Communities was added to the document in compliance with Executive Order 12898. Comment item 4 is unclear, because the relationship between the heading (experimental trawl) and the subtext (mitigation by de-coupling of DAS) is not stated, nor does the DSEIS assert that de-coupling of DAS is mitigation for the experimental trawl. Nevertheless, neither the de-coupling of DAS nor the NFMA trawl experimental fishery are proposed actions. On item 5, the FSEIS now states that the canyon closures will take place at the same time as the other provisions of the amendment.

PUBLIC HEARING DOCUMENT

Amendment 2
to the
Monkfish Fishery Management Plan

New England Fishery Management Council
Mid-Atlantic Fishery Management Council

DATE/TIME	LOCATION
Tuesday, June 15 **6:00 pm**	Inn at East Wind 5720 Route 25A, **Wading River, NY** 11792
Wednesday, June 16 **6:00 pm**	Ramada Inn Toms River 2373 Route 9, **Toms River, NJ** 08755
Thursday, June 17 **7:00 pm**	Roanoke Island Festival Park 1 Festival Park, **Manteo, NC** 27954
Tuesday, June 22 **6:00 pm**	Holiday Inn Express 110 Middle Street, **Fairhaven, MA** 02719
Wednesday, June 23 **6:00 pm**	Holiday Inn, Peabody One Newbury Street, Rte 1 North, **Peabody, MA** 01960
Thursday, June 24 **7:00 pm**	DoubleTree Hotel 1230 Congress Street, **Portland, ME** 04102



PUBLIC HEARING SUMMARY
Monkfish Amendment 2

Wading River, NY
June 15, 2004

Hearing Officer: Laurie Nolan
Attendance: approximately 8

Six commenters opposed the proposal to separate the days-at-sea usage requirements, Alternative 1, Decision 1. They all voiced concern that such an action would result in an increase in effort in the southern area, and that as a consequence days-at-sea allocations and trip limits would have to be reduced to accommodate the additional vessels that would be fishing for monkfish. Some said they would not benefit from de-coupling because they lost their multispecies DAS under Amendment 13. No one spoke in favor of the proposal.

In spite of their opposition to de-coupling DAS, three people said they would support DAS leasing/sale proposals if DAS were de-coupled. One said that in that situation he would oppose leasing but support DAS sales. One of the commenters noted that vessels in the southern area are currently at a disadvantage because they cannot afford the $1,000/DAS (going rate for multispecies DAS leases) at the low trip limits and depressed prices for monkfish.

If DAS are de-coupled, one person supported Fleet DAS and no one spoke in favor of Individual DAS.

Four people opposed lowering the minimum fish size, and two of those felt it could be increased, coupled with appropriate minimum mesh size increases. They said all trawl and gillnet mesh size should be 12 inches when fishing for monkfish. Some expressed the view that if vessels are discarding monkfish because of the minimum size, they should use more size-selective gear.

One person stated that all vessels should be required to use VMS.

One person supported taking no action on the proposal to allow retention of an incidental catch limit on General Category Scallop vessels and Surf Clam/Ocean Quahog vessels (Alternative 1, Decision 3) because of the potential for increased effort on monkfish. He supported allowing vessels under the 50 lb. incidental limit to retain 50 lbs./day up to 150 lbs (Alternative 2, Decision 2).

One person supported no action on the proposal to change the fishing year (Alternative 1, Decision 15).

NY

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JUN 15 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

June 13, 2004

New England Fisheries Management Council

To Whom It May Concern:

As a fisherman who fishes in the south, after receiving drastic cut backs for the 2004-2005 fishing year, we can't support decoupling of the monkfish from the multi-species and scallop days.

It will drastically increase the fishing effort in the south. And we can't afford anymore unforeseen reductions in days at sea or trip limits that the decoupling will cause.

We support status quo.

Sincerely, Richard M. LaRocca Sr
F/V Capt Rich
Fed Monkfish Advisor -

Please do not decouple, as this will cause many fisherman undue hardship.

Yours truly
Richard M LaRocca Sr
06/15/04

NY

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NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

June 13, 2004

New England Fisheries Management Council

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We support status quo.

Sincerely,

Richard Knotoff

Richard Knotoff
F/V Nancy Lyn

NY

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NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

June 13, 2004

New England Fisheries Management Council

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We support status quo.

Sincerely,

George Wayne
38 East Pond Lane
Eastport N.Y.
11941

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JUN 15 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

June 13, 2004

New England Fisheries Management Council

To Whom It May Concern:

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It will drastically increase the fishing effort in the south. And we can't afford anymore unforeseen reductions in days at sea or trip limits that the decoupling will cause.

We support status quo.

Sincerely,

Roger Reeve

305 Walker Ct.
E. Moriches, NY
874-4383

Full Time Com. Fisherman

PUBLIC HEARING SUMMARY
Monkfish Amendment 2

Toms River, NJ
June 16, 2004

Hearing Officer: Jim Ruhle
Attendance: approximately 10 (five or six more arrived after the hearing ended)

Most commenters opposed de-coupling the days-at-sea usage requirement, except one who supported it and two who said they needed more time to think about it. Those who opposed it expressed the same concerns as those in the previous hearing about increased effort and the impacts on stock rebuilding, trip limits and DAS allocations. One of them supported both DAS leasing and sale transfer proposals, however, while one opposed them. Three people who opposed de-coupling DAS said that if it is done anyway, they supported Fleet DAS allocations and opposed Individual DAS.

On Decision 4 (incidental catch limit west of 72°30'W), one commenter supported restoring the limit to its original level (Alternative 2).

On Decision 7 (closed season), one person felt that the closure should be eliminated (Alternative 2) because it is useless.

One individual supported the concept of the offshore fishery program (Decision 8), but did not support the season restriction. He said that limiting the time to October-April would put smaller vessels at a disadvantage because of the weather.

On Decision 9 (permit qualification for vessels south of 38°00'N), three people supported any of the alternatives that would qualify those vessels.

One person commented on Decision 13 (vessel upgrading baseline), saying that he did not oppose the proposal (Alternative 2) for the reasons that are given, but did not support it in cases such as his where a different vessel measurement formula was applied to after the initial (multispecies) permit was issued, resulting in a higher tonnage and length baseline in subsequent permits, such as monkfish. Under the wording of the proposal, his upgrading baseline would be reset to a lower level.

PUBLIC HEARING SUMMARY
Monkfish Amendment 2

Manteo, NC
June 17, 2004

Hearing Officer: Jim Ruhle
Attendance: 4 (one did not sign in nor speak)

Two attendees engaged only in the question-and-answer session and said they would submit comments in writing later.

One commenter was divided on the question of whether to de-couple the days-at-sea usage requirement because he has two vessels, one with both a monkfish and multispecies permit and one that would get a monkfish only permit under the proposed qualification criteria alternatives. He recognized the pros and cons of separating DAS, and how it would benefit his vessel that two permits. He said he needed more time before making any definitive comment on Decision 1.

On Decision 9, permit qualification criteria, he supported Alternative 3 (monkfish landings during the March 15-June 15 period over the four years prior to June 15, 1998) and would like the Councils to consider, if they approve one of the alternatives, how they can be issued the permit on May 1, 2005. This would require NMFS to process the applications prior to the effectiveness date of the rule. The rationale for his request is that the monkfish season (when the fish are available) is short, and ends in June.

PUBLIC HEARING SUMMARY
Monkfish Amendment 2

Fairhaven, MA
June 22, 2004

Hearing Officer: David Pierce
Attendance: approximately 14

All of the seven people who provided comment opposed the proposal to separate the days-at-sea usage requirements, Alternative 1, Decision 1. They were concerned about the potential increase in effort, both from Category C and D vessels that now fish in the southern area, but not on monkfish DAS, and from vessels that fish for multispecies and monkfish in the northern area (with no monkfish trip limit when on a multispecies DAS) who would have monkfish-only DAS to fish in the southern area. One commenter objected to the use of the term "potential" to describe the increase in effort, because he felt it was certain. Another pointed out that monkfish effort will also increase as multispecies "B" days are activated for monkfish fishing. One person suggested waiting until the stock rebuilds and the DAS and trip limits can be increased before considering separating the DAS.

Several fishermen said that the 2004 allocation of 28 DAS (to fish in the southern area) is at or below their breakeven point, and they could not remain in business if there were any further cuts (as a consequence of more vessels fishing for monkfish with de-coupled DAS). Commenters added that if landings increase, prices will remain soft making it even harder to make a living. Thus, the problem with separating DAS is not only a conservation one, but a social and economic one.

One fisherman observed that almost all of the fisheries that support vessels in the small ports from Cape Cod to Long Island are either collapsed or under such severe restrictions, and monkfish is one where they can still generate revenues. If DAS are separated, he argued, monkfish effort will increase to the point where the necessary cuts will eliminate one of the few fisheries sustaining these small-vessel communities. He said that vessels in his area would rather have more DAS than a higher trip limit, and that keeping the trip limit relatively low will also help mitigate some of the impacts of separating DAS, if that is done. One commenter noted that Rhode Island just released a report saying that incomes below $50,000 are below the poverty level for the state, and that at current trip limits and DAS levels; he cannot pay the crew enough to put them above that level. This situation will be worsened if more vessels begin to target monkfish under separated DAS.

On Decision 2, adjustment to the 50 lbs. incidental catch limit, one person supported taking no action, while another supported Alternative 3, 50 lbs./day with a 500 lbs. maximum, because he said it would reduce regulatory discards.

Two people spoke in support of increasing the trawl minimum mesh size, Decision 5. One specifically stated it should be 12-inch mesh throughout the net. Another said that if discards are occurring, vessels should use larger mesh, whether or not it is required.

On Decision 6, minimum fish size, four people commented, all in opposition to reducing the minimum size. One noted that if other fisheries have a monkfish discard problem, the solution should be implemented within the appropriate management plan, not simply by lowering the allowable size. All supported a uniform size in both areas, but said the size should be 14 inches (tails) or larger.

Three people commented on Decision 7, the closed season. Two supported eliminating it, pointing out that gillnetters already have other closures (harbor porpoise), and that a 20-day block is ineffective and reduces flexibility. One person supported no action (retaining the 20-day block).

On Decision 8, the offshore fishery program, one person supported no action because he felt it would have a negative impact on the resource. He said that the offshore area is the source area for the fish that migrate inshore and become available to the fishery. Another person suggested that the proposed trawl gear be proven effective before the offshore fishery is opened up.

One person supported no action on Decision 9, saying it made no sense to have a different set of permit qualification criteria for some vessels and not others.

FAIRHAVEN 6/22/04

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Related to de-coupled DAS specifically Preferred Alternative 1,

The Proposal Amendment 2 to the monkfish fishery Management Pan has parts that have potentially disastrous outcome foe those fishermen relying on the directed monk fishery. These specific parts absolutely need to be reexamined in order to preserve the livelihood of those individuals.

Limited access Scallop, Monkfish and multi-species DAS were designed to be inclusive to protect and conserve both the monk fishery and the multi-species fishery. The separation of these days would create a tremendous effect on both fisheries, especially the monk fishery. To allow multi-species, limited access and Scallop permit holders, who also have monkfish permits to " free up " their DAS to target monkfish is unfair and unsound. Fishermen who originally had both multi species and monkfish permits and chose to exclusively target monkfish had the multi species permit DAS taken away.

who targeted multi species and scallops

Therefore, it is unimaginable that multi species limited access and scallop permits holders instead of monkfish are being considered for additional DAS to specifically target monkfish. This consideration would produce serious infringements on the fishermen relying solely on the monk fishery because of the drastic reduction of DAS that could result from increase in effort.

For these reasons Alternative 1 should be abolished and Alternative 2 implemented

Sincerely
Dean Pesante

William [illegible]

[illegible]

PUBLIC HEARING SUMMARY
Monkfish Amendment 2

Peabody, MA
June 23, 2004

Hearing Officer: David Pierce
Attendance: 2

The two people in attendance engaged in a question-and-answer session, and said they would submit written comments later.

PUBLIC HEARING SUMMARY
Monkfish Amendment 2

Portland, ME
June 24, 2004

Hearing Officer: David Pierce
Attendance: 2, plus 3 Maine DMR observers

Both commenters indicated that they would be submitting written comments before the end of the comment period.

On Decision 1, the separation of DAS proposal, one person representing a number of fishing vessels said that the group initially supported the idea but now needs to reconsider in light of recent changes in the region's fishery regulations, especially the proposals for allowing multispecies vessels to target monkfish on their "B" days, and the issue of increased monkfish effort, especially from large scallop vessels, that would result from separation of DAS usage requirements.

The other commenter said that she supported combined DAS in the initial monkfish plan, but with the evolution of the groundfish regulations, began to consider separating DAS as way to alleviate some of the burden on groundfish vessels. She is now strongly opposed to separating DAS, however, because of the potential increase in effort on monkfish from the "B" days proposal. She noted that the monkfish resource in the northern area is relatively stable and valuable, and that that condition would be jeopardized by a sudden increase in effort. She said that the Councils should realize that if we had not had a cut in Multispecies DAS, there would have been more effort on monkfish than just the A days, but given the limited choices vessels in the Gulf of Maine will have to use their B days, there will probably be much more effort on monkfish than if those same vessels could use their B days like A days. While there does not seem to be a mechanism to limit B day effort on monkfish, we certainly do not want to add more effort on monks by splitting the days.

She was also concerned about the impact the proposal would have on groundfish stocks, if multispecies DAS that were otherwise used to target monkfish were now "freed up" to focus on groundfish. She noted that monkfish is very important to the trawl fleet in the Gulf of Maine, and, while some vessels may have the ability to fish in alternative fisheries, others do not, and would bear the brunt of any increased effort.

If DAS are separated, she stated that the individual DAS qualification formula needs to be adjusted to count days where monkfish landings comprised a smaller percentage than the options offered in the amendment document. The lowest criterion currently under consideration is days where monkfish made up 40 percent of the total weight of fish on board. She also said that she would only support transfer of monkfish DAS if it were to be done in conjunction with multispecies DAS transfers, but not if monkfish DAS were transferred independently.

On the minimum fish size, Decision 6, one person supported either no minimum size or a uniform size in both areas. The other pointed out that the size composition of the catch is very different between inshore and offshore areas, and that should be considered in setting the minimum fish size.

One person supported the concept of the alternatives in Decision 9, permit qualification criteria for vessels fishing south of 38°00'N, but did not identify one alternative of the four under consideration.

On Decision 11, the EFH alternatives, one commenter said that the obligation of the Councils is to "minimize *identified* adverse impacts on EFH", and she does not believe that there is an identified adverse impact of monkfish trawl gear on EFH of other species (noting that the Gear Effects Workshop found such gear has a low impact on monkfish EFH). The other commenter felt that many of the elements of the proposed monkfish trawl net would have the opposite effect than intended. On the coral area closures, she supported Alternative 5AB (Oceanographer and Lydonia Canyons) but doubted the basis for supporting closure of the other canyons. She said those two are physically different than the others, being deeper and narrower, and provide the protected environment for corals to live. The other canyons are more susceptible to storm damage and other dynamic events that make them less capable of supporting corals (which would become buried).

One person supported the vessel upgrading baseline changes proposed in Decision 13.

Another commented that the monkfish experimental fishery proposal is important because areas/seasons/gear configurations must be identified so vessels can target monkfish without catching the groundfish species of concern.

Monkfish FMP Amendment 2

Summary Table of Written Comments for comments received through 7/28/04 comment period

(late comments not included in summary)

Summary of Monkfish Amendment 2
Written Comments

NOTES: Preferred Alternatives are <u>underlined</u>. The following summarizes <u>only written comments</u> to avoid double counting of public hearing comments that were followed up with written comments.

Decision 1	Support/Oppose	Additional Comment
<u>DAS Alternative 1</u> – Category C and D vessels may decouple MF DAS from Scallop or Multispecies DAS usage requirements	All written comments opposed	One suggested consideration of de-coupling for offshore program vessels, implemented incrementally
DAS Alternative 2 – Category C and D vessels on a MF DAS must also use a Scallop or Multispecies DAS		Commenters were concerned about the potential effect of increased effort on monkfish rebuilding, annual adjustments to trip limits and DAS to currently active vessels, and the impact of "freed up" multispecies DAS on groundfish.

NOTE: The following decisions 1a-1d pertain only to Alternative 1 above. Since all written comments opposed Alternative 1, the following comments were made for consideration in the <u>event the Councils decide to adopt Alternative 1 anyway.</u>

Decision 1a	Support/Oppose	Additional Comment
DAS Alternative 1a – Area-based de-coupled DAS (SFMA only) by annual declaration		
<u>DAS Alternative 1b</u> – Annual declaration for de-coupled DAS, not area based	One supported	

Decision 1b	Support/Oppose	Additional Comment
<u>DAS Alternative 1 Option 1a</u> – Fleet MF DAS *(MAFMC preferred alternative)*	Three supported	
DAS Alternative 1 Option 1b – Individual MF DAS	One opposed	One would support if a lower qualification threshold than 40% of total wt. of fish on board were used

Decision 1c	Support/Oppose	Additional Comment
DAS Alternative 1 Option 2a – Implement transferable MF only DAS under Amendment 2 rule	One supported	
<u>DAS Alternative 1 Option 2b</u> – Include transferable DAS in list of possible actions under framework adjustment process	One supported	

Decision 1d	Support/Oppose	Additional Comment
Transferable DAS Option 1 – No action		
Transferable DAS Option 2 – DAS Leasing	Three supported	One supporter said only if done in conjunction with Multispecies DAS leasing. Another commenter also made detailed comments on the options for the leasing program in the document
Transferable DAS Option 3 – Sale of DAS	Two supported	

Decision 2	Support/Oppose	Additional Comment
Incidental Catch Alternative 1 – No action – 50 lbs.		
Incidental Catch Alternative 2 – 50 lbs./day - 150 lbs. max.	Two supported	
Incidental Catch Alternative 3 – 50 lbs./day - 500 lbs. max.	Two supported	

Decision 3	Support/Oppose	Additional Comment
GC Scallop/clam dredge Alternative 1 – No action		
GC scallop/clam dredge Alternative 2 – Include in Decision 2 incidental limit	Three supported	One supporter said these vessels should be kept at 50 lbs. possession even if an increase is adopted in Decision 2.

Decision 4	Support/Oppose	Additional Comment
Incidental catch limit west of 72°30' Alternative 1 – No action		
Incidental catch limit west of 72°30' Alternative 2 – Include in Decision 2 incidental limit (restore original incidental limit).	Three supported	

Decision 5	Support/Oppose	Additional Comment
Minimum mesh size Alternative 1 – No action	Three supported	
Minimum trawl mesh size Alternative 2 – 12" throughout trawl net		
Minimum trawl mesh size Alternative 3 – 12" sq. codend		

Decision 6	Support/Oppose	Additional Comment
Minimum fish size Alternative 1 – No action	One supported	
Minimum fish size Alternative 2 – Uniform fish size in both areas; Options for 11" and 10" tail.	Two supported option at 11" tail	Four commenters said not to lower the min. size, two said it should be increased. One supported either Alt. 1 or 2. One suggested different min. sizes for inshore/offshore fisheries.
Minimum fish size Alternative 3 – no min. fish size		
Minimum fish size Alternative 4 – Uniform, 14" tail in both areas on MF only DAS, one of above options for MS/MF DAS. Only applies if DAS are decoupled in Decision 1.		

Decision 7	Support/Oppose	Additional Comment
Closed Season Alternative 1 – No action (20 days out)	One supported	
Closed Season Alternative 2 – Eliminate closed season	One supported	
Closed Season Alternative 3 – 40 day closed season	One opposed	Opposed increasing while allowing other vessels to land monkfish under the bycatch limits.

Decision 8	Support/Oppose	Additional Comment
Offshore SFMA Fishery Alternative 1 – No action		
Offshore SFMA Fishery Alternative 2 – includes two area options and two trip limit/DAS options (Option 1 has variable trip limit/DAS ratios; Option 2 has fixed trip limit of 1,600 lbs./DAS with variable DAS ratio)	Two supported with Area Option 1 and Trip Limit Option 1. One supported with Trip Limit Option 2.	One supporter also suggested the Councils consider limiting the total number of DAS that can be used in this fishery. One supporter opposed the season limitation.

Decision 9	Support/Oppose	Additional Comment
Permit Qualification Alternative 1 – four years prior to 6/15/98	One supporter for any of these four options.	
Permit Qualification Alternative 2 – four years prior to 6/15/97		
Permit Qualification Alternative 3 *MAFMC preferred alternative* – four years prior to 6/15/98 (3/15 – 6/15 only)		
Permit Qualification Alternative 4 - four years prior to 6/15/97 (3/15 – 6/15 only)		
Permit Qualification Alternative 5 – no action		

Decision 10	Support/Oppose	Additional Comment
NAFO Area Exemption Alternative 1 – allow exemption	One supported	
NAFO Area Exemption Alternative 2 – no action	Two supported	

Decision 11	Support/Oppose	Additional Comment
Essential Fish Habitat Alternatives. Except for no action, alternatives are not exclusive, that is, Councils may select more than one preferred alternative.		
EFH Alternative 1 - no action	Two supported	
EFH Alternative 2 - Consider other Amendment 2 actions		
EFH Alternative 3 – Consider MS Amendment 13 and Scallop Amendment 10 actions	One supported (combined with Alternative 1)	
EFH Alternative 4 – Trawl gear modification options. Option 1: no action; Option 2 specified trawl net design; Option 3 max. disc diameter in SFMA, only to be considered if Option 2 not adopted and DAS not decoupled under Decision 1.	Two supported trawl gear Option 2; One opposed.	One commenter stated that Alternatives 4 and 5 exceed the Councils authority.
EFH Alternative 5ab – Oceanographer Canyon and Lydonia Canyon closure	~790 identical comments supported. Two individual comments supported. Four opposed. (also see 5c comment)	Questions about the legality of this action are under discussion between the agency and Councils. Petition for rulemaking to protect corals has been filed. Three commenters felt coral protection should be taken up in the Habitat Omnibus Amendment. One said the closures should apply to all gears (including traps and longlines).
EFH Alternative 5c – Major steep-walled canyons closure	12 supported. Four opposed.	The 12 comment letters supported 5AB if 5C is not adopted.

Decision 12	Support/Oppose	Additional Comment
Cooperative Research programs funding. Two alternatives, not including no action, could both be adopted. Research could be to minimize bycatch, minimize impacts on EFH or other habitat, research to establish exempted fisheries, biology or population dynamics of monkfish, cooperative surveys and gear efficiency, among others.		
Research Alternative 1 – DAS set aside	Three supported	
Research Alternative 2 - DAS Exemption	One supported	
Research Alternative 3 – no action		

Decision 13	Support/Oppose	Additional Comment
Vessel Upgrading Baseline Alternative 1 – no action		
Vessel Upgrading Baseline Alternative 2 – set baseline at first federal permit level	Four supported	One commenter said the tonnage component should be left out of the baseline restrictions due to measurement method changes.

Decision 14	Support/Oppose	Additional Comment
NFMA trawl experimental fishery Alternative 1 – no action		
NFMA trawl experimental fishery Alternative 2 – establish GOM experimental fishery for two years	Three supported	

Decision 15	Support/Oppose	Additional Comment
Change the fishing year. Three alternatives plus no action. Based on alternatives under consideration in Multispecies Amendment 13, but Councils could choose independently from what is adopted in Amendment 13. Would require prorating of DAS during transition period; alternatives provided in next section.		
Fishing Year Alternative 1 – no action	Four supported	
Fishing Year Alternative 2 – calendar year		
Fishing Year Alternative 3 – Oct. – Sept.		
Fishing Year Alternative 4 – July - June		

Decision 16 – no preferred alternative	Support/Oppose	Additional Comment
DAS Prorating alternatives. One of the following two alternatives is only necessary if the Councils select a different fishing year under the previous set of alternatives. They do not apply if the Councils take no action on the fishing year question.		
DAS Prorating Alternative 1 – partial year		
DAS Prorating Alternative 2 – full year plus partial year		

Decision 17	Support/Oppose	Additional Comment
Modify Framework Adjustment procedure – Alternative 1 - No action		
Include measures to minimize impact on protected species - Alternative 2	Three supported	
Include bycatch reduction devices Alternative 2	Three supported	

NOTE: One comment letter made extensive comments not specific to any of the above decisions. It stated that Amendment 2 fails to contain specific measures to adequately protect gravel habitats found within juvenile cod EFH on Georges Bank and Great South Channel. The amendment fails to establish a standardized bycatch reporting methodology, and fails to include measures to avoid bycatch or minimize mortality of unavoidable bycatch. See comments package for full details.

New England Fishery·Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Written Comments

June 17, 2004

RECEIVED
JUL 12 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

New England Fisheries Management Council

To Whom It May Concern:

As fishermen who fish in the south, after receiving drastic cut backs for the 2004-2005 fishing year, we can't support decoupling of the monkfish from the multi-species and scallop days.

It will drastically increase the fishing effort in the south. And we can't afford anymore unforeseen reductions in days at sea or trip limits that the decoupling will cause. We support status quo.

If the decoupling doesn't occur, we do have some general comments about the amendment that we like and dislike.

We are in favor of the transfer of the days at sea and or lease days at sea.

We are also in favor of mandatory VMS, if it will give us our days back from 28 to 40 of fishing time in the south.

Regarding vessel upgrading, we are against not being able to upgrade our permits. Our permits should be worth no more or no less than someone else. For example, someone with a category B or D permit and a 50 foot boat can fish off shore in winter when the price is higher. While I have a category A & C permit and a 35 & 36 foot boat, I can't fish off shore because of the weather in the winter. With hind sight being 20/20, we should have taken the same 100,000 pounds of tail weight that qualified us for two permits and turned it into thirteen 7,500 pound permits. That would be a big difference.

We used to fish, between both boats, 120 & 150 days a year and supported four families. Now, we are down to 28 days a year, for each boat, and barely support two families. If I want to take the chance of buying a bigger boat to generate more money with my permit, I should be able to. At least upgrade once.

Sincerely,

Timothy Froelich

Timothy Froelich,
F/V Miss Independence

Carl Froelich

Carl Froelich,
F/V Sea Queen
84 Pleasure Dr.
Riverhead, NY 11901-4905

comments

From: chuck etzel [chucketzel@yahoo.com]
Sent: Tuesday, July 13, 2004 6:09 PM
To: comments@nefmc.org
Subject: amenment 2

To Whom it may concern,

I have read through the proposals for amendment 2 and do not support the decoupling of DAS. We have a stock that is coming back and it is ridiculous to think of altering the FMP and worse increase the effort on a fishery that is already in peril. I have been cut hard in das and trip limits. I can barely keep a part time mate. De coupling DAS would completely change the way our DAS were distributed. Individual Das would crucify newcomers into the fishery that invested large sums of money into this fishery only to be told that they do not qualify cause of the poor landings for certain years. How many times will fisherman have to qualify for these limited access permits? I think one time is enough. It is getting ridiculous. I have seen it done with swordfish,lobster areas,and multispieces permits. I qualified for my limited access permits there is a vast injustice if I have to qualify again for my monkfish b permit.I am not for individual DAS at all. I feel we might as well go by way of ITQ"s.There is only enough das and qouta for real fisherman.If armchair fisherman and multiple boat owners get ahold of das it will be that much harder for fishermen to earn a living off the water. We are already plagued with inflated qouta and permit prices. How does the average fisherman afford to go ocean clamming when the price per bushel is 60$ per bushel and the ex vessel price is 14 dollars per bushel. It would take years of landing before the bushel is close to payed for.Individual das and ifq"s are not the way to go. Please take no action keep our fmp the same. Monkfish are coming back. Thanks for considering my view.

F/V Keeper Charles Etzel jr

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JUL 1 6 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

DENIS LOVGREN
306 SUDBURY RD.
PT. PLEASANT, N.J.
08742
F/V LEAH

TO NEW ENGLAND FISHERY COUNCIL,

I ATTENDED THE PUBLIC HEARING IN TOMS RIVER AND COMMENTED ON RECORD. SINCE ATTENDING THAT MEETING AND REVIEWING THE PUBLIC HEARING DOCUMENT I WANTED TO FUTHER COMMENT.

I CURRENTLY OWN AND OPERATE A 70 FT TRAWLER AND HAVE A CATEGORY D PERMIT.

I THINK THE FAIREST WAY FOR ALL LIMITED ENTRY PERMIT HOLDERS AND THE MONKFISH RESOURCE IS TO NOT SEPARATE DAS ON CATEGORY C + D VESSELS. IF DAS ARE SEPARATED THEN I AM IN FAVOR OF FLEET DAS ALLOCTATIONS.

I AM IN FAVOR OF DECISIONS 2, 3, AND 4 IN INCREASING THE INCIDENTAL CATCH LIMITS.

I AM OPPOSED IN DECISION 8 TO A SEASON OF OCT - APRIL 30. THIS IS IN THE HEART OF THE WINTER.

I THINK DECISION 13 VESSEL UPGRADING NEEDS TO BE WORKED DIFFERENTLY. I AM ONE OF THE VESSELS THAT HAVE

TWO DIFFERENT BASELINES ON MY PERMITS. MY LENGTH + HORSEPOWER ARE THE SAME ON ALL, BUT MY TONNAGE ARE DIFFERENT BETWEEN MY GROUNDFISH PERMITS AND MY OTHER PERMITS. MY BOAT WAS BUILT IN 1967 AND I CORRECTED MY BOAT DOCUMENTATION PAPERS IN 1999 USING THE COAST GUARD SIMPLE FORMULA TO DETERMINE MY CORRECT TONNAGE. NMFS WOULD NOT CHANGE MY TONNAGE ON MY GROUNDFISH PERMIT. MOST BOATS BUILT BEFORE 1984 HAVE TONNAGE BASELINES THAT DONT REFLECT THE BOAT. I THINK THE TONNAGE BASELINE SHOULD BE LEFT OUT UNTIL NMFS CORRECTS PRE-1984 BOATS USING THE COAST GUARD SIMPLE FORMULA.

THANK YOU,
DENIS LOVGREN

FISHERMANS DOCK CO-OP INC
57 CHANNEL DRIVE
POINT PLEASANT BEACH N.J. 08742

Paul Howard
NEFMC
50 Water street
Newburyport, MA 01950

July19,20004

Comments on Monkfish Amendment 2

Dear Paul,

Please accept these comments from the fishermen of the Fishermans Dock Co-op regarding the proposed regulations included in the Public Hearing Document for Amendment 2 Monkfish. The Fishermans Dock Co-op has been operating for over 50 years, and consists of 15 members, 14 member boats, and directly employs around 100 people annually between the boats, the dock, and our seafood market. We pack numerous nonmember boats, of which a large portion of them pack Monkfish. Point Pleasant has been a major landings port for Monkfish for the last decade, and the Co-op is by far the largest fish unloading dock in port.

Regarding decision 1 separation of DAS. We support Alt. 2 no action, because we feel that separation of DAS will substantially increase effort on the southern stock of Monkfish, and that this stock is not in a strong enough condition to withstand increased effort, which means that the fishermen in our region will be forced to take cuts in their DAS allocations and reductions in their trip limits. If Alternative 1 is passed, we would support the idea that Separate DAS could only be used on the Northern Stock of Monkfish, and that to do so would require an annual declaration by the fishing vessel of his intention. This would also include use of VMS to assure that the vessel was fishing in the Northern region. Further we do not support the individual DAS allocation, we prefer the Fleet DAS. Our trawl fishermen fit into the category of vessels that found themselves unable to economically make directed Monkfish trips because of the small trip limits and inability to "run the Clock". [We support efforts to enable this fishery to exist once again]. We feel that Individual DAS allocation will benefit more of the last people to arrive at the party, at the expense of historical participants who had their fishing efforts curtailed due to management effects. Also, it would be inappropriate to approve this measure since no one has seen what their allocation would be, and since the DEIS promised it would be available prior to the public hearings, any comments regarding this issue would be made without adequate knowledge of the effects on an individual's allocation. We also support a leasing program for DAS similar to the Groundfish program, regardless of whether DAS are allowed to be split. The details of this program should be worked out in a future framework.

Regarding decision 2, we support Alt. 3, a maximum of 500 pounds over 10 days. This will result in less regulatory discards, without any increase in fishing mortality.

Decision 3, we support alt. 2, but feel that it should be kept to a 50 pound a trip limit, and not allowed to be accumulated over a number of days. General Category vessels rarely fish longer then one day, and allowing a larger catch of Monkfish will encourage them to stretch out their day.

Decision 4, We strongly support the restoration of the 72:30 line as specified in the original Monkfish FMP. The movement of the line by the Groundfish Interim Rule in 2002, has had a negative effect on all Summer flounder vessels fishing west of that line, primarily in the offshore fishery in the winter as monkfish that would accumulate over a multiple day trip would have to be discarded when the trip limit was reached.

Decision 5 , we support the no action alternative on mesh size.

Decision 6 we support Alternative 2, a uniform fish size in both areas, and an 11 inch tail/ 17 inch whole fish.

Decision 7, we have no preference, but do support the idea of protecting spawning fish in season by possibly increasing the length of the block of time in the spring season, and only allowing landings of bycatch in non directed fisheries during that time.

Decision 8 we support SFMA offshore fishery Alternative 2, with offshore area option 1, and DAS trip limits option 1 .

Decision 9, we support alternative 3 for modification of permit qualification criteria for vessels fishing south of 38:00.

Decision 10, we support Alternative 2, no action, because we feel this to be a prudent deterrent against the development of deep water fishery outside of the EEZ, in what may be sensitive marine habitat.

Decision 11 EFH, we support the preferred options as stated in the document, except for alternative 5. While we feel it is important to protect deep water corals, we also feel it is important to have adequate information on its location and its importance to the functions of a healthy ecosystem. Until more information becomes available with better mapping of coral locations we feel that specific area closures should be addressed in a future framework, or the Omnibus Habitat amendment.

Decision 12, we support research Alternative 1.

Decision 13 we support Vessel upgrading baseline Alternative 2.

Decision 14 we support Alternative 2 creation of a NFMA trawl experimental fishery. This could help define how a directed Monkfish fishery could exist in the NFMA without substancial impacts on Groundfish. This programs success could then lead to Separation of DAS for the Northern Area.

Decision 15, we support Alternative 1, no change to the current start of the fishing year.

Lastly decision 17, we support inclusion of both Alternatives 2 and 3 as frameworkable items.

Thank you for your consideration of our views on these important issues,

Sincerely,

John Cole

John Cole, President, F.D.CO-OP
On behalf of the membership

ASSOCIATED FISHERIES OF MAINE –THE GROUNDFISH GROUP

PO Box 287, South Berwick, ME 03908 phone 207-384-4854 fax 207-384-2940

July 26, 2004

Mr. Phil Haring
Monkfish Plan Coordinator
New England Fishery Management Council
50 Water Street – Mill 2
Newburyport, MA 01950

COMMENTS ON AMENDMENT 2 TO THE MONKFISH PLAN

Dear Mr. Haring:

On behalf of Associated Fisheries of Maine (AFM), I submit the following comments on amendment 2 to the monkfish fishery management plan (FMP). AFM's comments are limited to those aspects of the plan that may directly impact our members.

Separation of DAS for Category C& D vessels

AFM supports alternative 2 no action.

AFM supported the original provisions of the monkfish fishery management plan, which linked monkfish DAS to groundfish DAS because this linkage would prevent a directed fishery for monkfish in the monkfish northern fishery management area (NFMA). AFM believes that the current healthy status of monkfish in the NFMA is the result of the monkfish fishery being a bycatch in other fisheries rather than a directed fishery.

AFM offers the following advice regarding application and allocation of separated DAS, noting that none of these sub-decisions are necessary if the Councils support the no action alternative relative to DAS separation.

AFM supports application decision 1b – separated DAS should apply to both areas. Separation of DAS in the southern fishery management area (SFMA) would likely increase fishing effort on the SFMA. The monkfish resource in the SFMA currently cannot absorb additional fishing effort.

AFM supports DAS allocation alternative 1, option 1a – fleet DAS allocations. The application of individual DAS allocations would result in a limited number of fishing vessels with monkfish DAS allocations, and would therefore downgrade most current monkfish permits from category C or D to category E. This could lead to potential monkfish discard problems in the groundfish and scallop fisheries.

Associated Fisheries of Maine
Comments on Monkfish Amendment 2
July 26, 2004

AFM supports transferable DAS alternative 1, option 2a – transferable monkfish-only DAS would be allowed on May 1, 2005. AFM supports transferable option 2, DAS leasing. AFM supports conservation equivalency option 2b – DAS subject to the calibration factors outlined in Table 5 (pg 17, public hearing document), as well as DAS limitations option 3 – a cap on DAS of 365 DAS/vessel, permit history option A – leased DAS are considered used first, and expiration option 1 – any program adopted will continue indefinitely unless modified by action by the Councils. AFM would also recommend that the Councils apply DAS leasing conservation equivalency option 2b (regarding calibrations) and DAS limitations option 3 (regarding the total number of DAS that a vessel can acquire) to be applied to DAS transfers. Regarding DAS transfer reductions, AFM supports neither option 1 or 2, but instead would propose the monkfish plan adjust option 1 to allow for a zero % reduction in active DAS (or a reduction of no greater than 20%), and a 100 % reduction in inactive DAS. Regarding definition of "active" DAS, AFM supports option 2 (which we are assuming combines DAS call-in activity with the proposed landings threshold). Regarding reactivation of DAS, AFM supports option 2 (immediate use).

In short, AFM supports the greatest amount of flexibility in any DAS transfer or leasing program.

Minimum mesh size on monkfish trawl vessels

AFM supports alternative 1 – no action. If, however, the Councils support the separation of monkfish DAS, AFM would support mesh alternatives 2 and 3, option 1. AFM also questions the authority of the monkfish plan to alter the mesh requirements of the Multispecies plan. Increasing the current mesh size in the groundfish fishery would cause significant, and unnecessary, loss of groundfish landings by AFM members.

Minimum fish size

AFM supports minimum fish size alternative 1 (no action), with the explanation that we believe the present minimum fish size in the NFMA is most appropriate.

Closed season – blocks of time out of the fishery

AFM supports alternative 1 (no action). Amendment 2 offers no rationale for changing this provision of the original FMP.

Exemption for vessels fishing for monkfish in the NAFO regulated area.

AFM supports alternative 1 – vessels would be exempt from provisions of the monkfish fishery management plan when fishing in the NAFO area.

Associated Fisheries of Maine
Comments on Monkfish Amendment 2
July 26, 2004

Alternatives to minimize the impact of the fishery on essential fish habitat

AFM supports alternatives 1 (no action). AFM supports action to protect coral and recommends that the Councils take a comprehensive look at the potential negative impact of all fishing gear, including lobster traps, on coral in the identified canyons. AFM recommends the Omnibus Habitat amendment as the appropriate place to make such determinations and take appropriate action.

Regarding alternative 4, AFM supports minimum mesh size option A (no action).

Cooperative research programs incentives

AFM supports research alternative 1.

NFMA Trawl experimental fishery

AFM supports experimental fishery alternative 2. AFM supports the establishment of monkfish only trawl exemption areas in the NFMA, and the proposed research is essential to establishing such areas.

Change the fishing year start date

AFM supports alternative 1 – no action. AFM believes there is not sufficient rationale to change the fishing year. Changes in the fishing year cause administrative and practical difficulties.

Modify the framework adjustment procedure

AFM supports alternatives 2 and 3.

As always, Associated Fisheries of Maine appreciates the Councils' consideration of our views.

Sincerely,

M Raymond

Maggie Raymond
Associated Fisheries of Maine

RECEIVED
JUL 26 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

July 22, 2004

Dear Mr. Borden:

I am writing to say that I support the creation of no-trawl zones in marine areas that contain fragile, and slow-growing deep-sea corals.

Bottom-trawling for monkfish is a major threat to deep-sea corals, because the monkfish fishery is trawling at depths greater than 1000 meters in order to catch large monkfish. While little fishing has occurred in these canyons in the past, it is likely that these areas will be trawled in the future, unless protections are put in place immediately!

I urge you to support the New England Fishery Management Council's Preferred Alternative (5AB, option 1) in Monkfish Amendment 2 to protect fragile deep-sea corals in two deep-sea canyons on Georges Bank – Oceanographer and Lydonia canyons – from bottom-trawling by fishermen catching monkfish. This is a proactive first step to protect New England deep-sea corals from the expanding offshore monkfish trawl fishery.

Thank you for considering my comments.

Sincerely,

Toni Siegrist
Harvard University
Office of the Secretary
17 Quincy Street
Cambridge, MA 02138

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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JUL 26 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

JUL 20 2004

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

National Marine Fisheries Service
Northeast Regional Office
Attention: Patricia Kurkul
One Blackburn Drive
Gloucester, MA 01930-2298

New England Fishery Management Council
Attention: Paul Howard, Executive Director
50 Water Street
Newburyport, MA 01950

Dear Ms. Kurkul and Mr. Howard:

In accordance with our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA), the Environmental Protection Agency (EPA) has reviewed the National Marine Fisheries Service's (NMFS) Draft Supplemental Environmental Impact Statement (EIS) supporting Amendment 2 to the Monkfish Fishery Management Plan (CEQ # 040195).

Amendment 2 was developed to address a number of issues that have arisen since implementation of the original Monkfish Fishery Management Plan (FMP) in 1999. The goals and objectives for the amendment as identified by the Councils include: 1) prevention of overfishing and rebuilding overfished stocks as necessary; 2) addressing problems identified at the time of implementation of the FMP; 3) improving data collection and research on monkfish; 4) addressing deficiencies in meeting requirements of the Magnuson-Stevens Fishery Conservation and Management Act; 5) addressing protected resources and fishery interactions, and 6) reducing the complexity, where possible, of the FMP.

EPA's overall rating of the Draft Supplemental EIS is LO-Lack of Objection to the proposed action. However, there are a few issues that should be further clarified and addressed in the Final Supplemental EIS. Specifically, the general issues are as follows:

1.) **Scoping**: The Draft Supplemental EIS states that the Notice of Intent was published December 10, 2001, and that a scoping meeting was held January 14, 2002. The final document should address whether any new issues/concerns of the public were raised during the various Council meetings after 2001 and up until publication of this Draft Supplemental EIS.

2.) **Affected Environment (Baseline Environment Resources Not Assessed)**: We recommend that the final document include a discussion on how NMFS determined which environmental resources would be impacted. We believe that the following resources could also be impacted by Amendment 2 to the Monkfish Fishery Management Plan and should be assessed in the document: marine water quality, subsistence harvesting, environmental justice communities, and air quality.

3.) **Environmental Justice Communities**: We recommend that a separate section of the final document include a description of the methods that were used to determine whether there are Environmental Justice (EJ) communities that may be adversely affected by the proposed actions. Also, the section should describe the methods used by NMFS to ascertain the issues and concerns of EJ communities as well as discuss the substance of the issues and concerns.

4.) **Experimental Trawl:** The Draft Supplemental EIS evaluates the decoupling of Days at Sea (DAS) fishing between Monkfish DAS permits and Groundfish DAS permits and states that this action is mitigation. The final document should provide an explanation on how the allocation or decoupling of Days at Sea fishing can be considered mitigative.

5.) **Groundfish Fishery**: The final document should also explain why fisherman in groundfish fishery use a groundfish DAS when they are directing effort at Monkfish and how the Monkfish fishery is now recovered enough to sustain the added fishing effort.

6.) **Rulemaking**: It is unclear in the Draft Supplemental EIS whether the proposed closure of the Lydonia and Oceanographer Canyons require separate rulemaking and what ramifications that may or may not have with regards to potential environmental impacts associated with the proposed action. The final document should explain if the proposed closures will take place at the same time as the changes to the Monkfish fishery.

We appreciate the opportunity to review this Draft Supplemental EIS. We also look forward to reviewing future documents related to this project. The staff contact for this review is Matthew Harrington and he can be reached at (202) 564-7148.

Sincerely,

Anne N. Miller

Anne Norton Miller
Director
Office of Federal Activities

cc: Steve Kokkinakis, NOAA Office of Strategic Planning
John Hansel, NMFS Office of Sustainable Fisheries
David Keys, NMFS Regional Administrator Office

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JUL 2 6 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

July 22, 2004

Dear Mr. Borden:

I am writing to say that I support the creation of no-trawl zones in marine areas that contain fragile, and slow-growing deep-sea corals.

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I urge you to support the New England Fishery Management Council's Preferred Alternative (5AB, option 1) in Monkfish Amendment 2 to protect fragile deep-sea corals in two deep-sea canyons on Georges Bank – Oceanographer and Lydonia canyons – from bottom-trawling by fishermen catching monkfish. This is a proactive first step to protect New England deep-sea corals from the expanding offshore monkfish trawl fishery.

Thank you for considering my comments.

Sincerely,

Toni Siegrist
Harvard University
Office of the Secretary
17 Quincy Street
Cambridge, MA 02138

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

JUL 27 2004

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JUL 27 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

David V.D. Borden, Chairman
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Dear David:

The following are comments on the Draft Supplemental Environmental Impact Statement (DSEIS) for Amendment 2 to the Monkfish Fishery Management Plan (FMP). NOAA Fisheries provided Council staff comments on previous drafts of this document, and many of these comments have been addressed in the current version, greatly improving the document. The comments listed below have been arranged by topic and section number (where appropriate) to better guide Council staff. Technical and editorial comments are provided in an attachment to this letter.

General Comments

- Throughout the document where there is a discussion regarding the potential increase in monkfish effort as a result of separating monkfish days-at-sea (DAS) from Northeast (NE) multispecies and scallop DAS, there is a statement similar to the one found under Section 6.2.1.1, "... if additional monkfish DAS are used, the program established in Framework 2 provides for an annual adjustment of trip limits to ensure that target catch levels designed to achieve annual biomass rebuilding goals are not exceeded." Should Amendment 2 be approved and implemented as scheduled in May 2005, there would be a 2-year gap before adjustments to target total allowable catch (TAC) levels and trip limits would be made to compensate for any increase in effort. This is because the annual adjustment method established in Framework 2 would utilize effort information from the previous fishing year. Therefore, any increase in effort during fishing year 2005 resulting from separating DAS would not be compensated for until fishing year 2007. Potential impacts of a 2-year lag in adjusting for any increase in monkfish fishing effort should be discussed in the impacts sections (biological, social, economic, habitat, etc.) of the document.
- Amendment 13 to the NE Multispecies FMP and Amendment 10 to the Atlantic Sea Scallop FMP have been implemented. Therefore, the Final Supplemental Environmental Impact Statement (FSEIS) should be updated (text and tables) to reflect that the measures contained in these amendments have been implemented, in particular the essential fish habitat (EFH) alternatives, discussion, and analyses. In addition, a discussion of the potential habitat benefits of the measures contained in Frameworks 16/39 to the NE Multispecies and Atlantic Sea Scallop FMPs should be included in the FSEIS.

Background, Purpose and Need (Section 2.0)

- Section 2.7 - The discussion pertaining to the annual adjustment mechanism established in Framework 2 should be expanded. Framework 2 is referenced throughout the document in terms of providing the ability of modifying the annual target TAC and, therefore, mitigating any potential increase in monkfish effort resulting from separating monkfish DAS from NE multispecies and scallop DAS. The document, therefore, should explain how the annual target TAC setting method established in Framework 2 functions.

Description of Alternatives (Section 4.0)

- Section 4.1.1.1.2, DAS Alternative 1b - This alternative, which proposes to de-couple monkfish DAS from NE multispecies and scallop DAS in the Northern Fishery Management Area (NFMA) is of concern due to the potential bycatch of non-targeted species, in particular NE multispecies, when fishing under a monkfish-only DAS in this area. Additional justification for this alternative will be necessary, should the Council decide to adopt this alternative (see below).
- Section 4.1.1.1.4, Alternative 1, Option 1b - Individual DAS Allocation - The calculation of individual DAS allocations based on days fished during 1997-2001 will be extremely difficult to implement since the qualifying period includes 3 years prior to the Monkfish FMP being implemented. Unless a vessel held another Federal permit during that time, it will be nearly impossible to determine a particular vessel's days absent, and accurately track that vessel's landings history.
- Section 4.1.1.5 - The document proposes that the DAS Leasing and DAS Transfer Program being considered in Amendment 2 would be based upon the parameters outlined in Amendment 13 to the NE Multispecies FMP "with monkfish-specific considerations." Please note that revisions to these programs in the groundfish fishery are currently being considered in Framework 40B to the NE Multispecies FMP. We recommend, for administrative reasons, that the DAS Lease and Transfer Programs be consistent among FMPs to the extent practicable.
- Sections 4.1.2.1.2 and 4.1.2.1.3 - The alternatives to change the 50-lb per trip incidental catch limit to 50 lb per day, up to a maximum of either 150 lb or 500 lb per trip, are manpower intensive from an enforcement perspective. A maximum trip limit, as opposed to one that is based on DAS, would be easier to enforce.
- Section 4.1.2.3 - This alternative, which would re-establish the 5-percent incidental catch limit west of 72°30' W. Long., would be difficult to monitor dockside. Varying trip limit requirements for different areas without the ability of enforcement to monitor a vessel's location (i.e., through the use of a vessel monitoring system (VMS)) make this measure difficult to enforce.
- Section 4.1.4 - A uniform minimum fish size limit, rather than having different minimum size requirements for each management area, would be better for the industry and enforcement purposes, since it would eliminate confusion.
- Section 4.1.6.1 - The description of the Offshore Fishery Program alternative states that vessels would be required to use a VMS during the October through April period, the proposed season for this fishery. However, it is our policy not to allow vessels to switch in and out of the VMS program. Therefore, if a vessel is required to use VMS

to participate in the Offshore Fishery Program, NOAA Fisheries maintains that the vessel should be required to remain in the VMS program for the entire fishing year.

- Section 4.1.6.2 - The discussion providing justification for the alternatives to modify the limited access monkfish permit qualification requirements for vessels fishing south of 30°N. Lat. should include some discussion of how reliant the owners of the fishing vessels in question were on the fishery prior the implementation of the Monkfish FMP. In addition, the document should include what percentage of the vessels' overall revenue was based on the monkfish fishery prior to the implementation of the FMP, as well as what it is currently (i.e., by fishing in state waters). This information should also be incorporated into the economic and social impacts discussion in Sections 6.4.8.2 and 6.5.2.9.1.
- Section 4.1.9.4 - We recommend that the no action option that is part of EFH Alternative 4, monkfish trawl configuration, be dropped, so that the alternative only includes the proposed gear modifications.
- Section 4.1.9.5, EFH Alternative 5 - Deepwater corals protection
  - Options to restrict only certain gear types in the areas proposed under the canyon closure alternatives, versus a closure to all fishing within the area, would complicate enforcement.
  - The deepwater coral alternatives, to the extent that they can be reasonably linked to mitigating direct or indirect impacts on monkfish EFH or the EFH of other species, provide a reasonable range of EFH alternatives and, therefore, for the purpose of complying with the National Environmental Policy Act (NEPA), the Council is justified in keeping them in the FSEIS. However, the Council should strengthen the argument that closing deepwater canyons to fishing by vessels participating in the offshore monkfish fishery would mitigate the expected indirect effects of an expanding fishery on undisturbed deepwater benthic ecosystems (including corals) that may provide EFH for other species.
  - The document should also discuss the incidental benefits of these measures in terms of mitigating the bycatch of deepwater corals in an expanding offshore monkfish fishery. This discussion should be cross-referenced with the bycatch discussion in Section 5.3.5 and the EFH assessment in Section 6.3. It would also be beneficial to add the deepwater coral bycatch discussion to Section 6.2.2, Impacts to Other Managed Species.
- Section 4.1.13 - Under the alternatives to clarify the vessel baseline history, as currently written, it appears that the preferred alternative would establish one vessel baseline for all fisheries. Given that the Council only has the authority to modify the vessel baseline provisions for monkfish limited access vessels in this amendment, the intent of this alternative needs to be clarified. Furthermore, the rationale for this alternative should include a discussion as to why the Council is not addressing this problem across all FMPs, since the issue of multiple vessel baselines frequently occurs with vessels having multiple limited access permits.
- Section 4.1.14.2, Monkfish Experimental Fishery Alternative 2 - The document states that limited access monkfish Category C and D vessels participating in this experimental fishery would be exempt from up to 1-percent of the total allocation of monkfish DAS, which will be approximately 300 DAS. However, the options for the amount of DAS to be contained in the DAS set-aside or DAS exemption under the

cooperative research alternatives are all below 300 DAS, except for Option 4, which is 500 DAS. How would the DAS exemption under this alternative work if the Council selects a lower pool of set-aside DAS or exempt DAS under the cooperative research alternative?

Affected Environment (Section 5.0)

- Section 5.1.1 - This section does not provide an adequate description of monkfish life history and habitat requirements. It should be expanded to include information contained in the Monkfish EFH Source Document and in the Fisheries of the Gulf of Maine by Bigelow and Schroeder.
- Section 5.1.8 – We recommend that this section be moved to page 99 and incorporated with other information on corals in a new Section 5.1.5.5 – Deep Water Corals. The numbering of the following sections should then be revised accordingly.

Biological Impacts (Section 6.2)

- Section 6.2.1 - The discussion concerning the impacts of Research Alternative 2 (DAS exemption) throughout this section should be expanded to include a relationship between the exemption of monkfish DAS for research purposes and the established target TACs. Although less than 50 percent of allocated monkfish DAS are currently utilized, the target TACs have been nearly achieved, or exceeded, in each fishing year since fishing year 2000. Any additional effort allowed for research would equate to additional fishing mortality. Given this, I have serious concerns regarding this alternative. The document should, at a minimum, estimate the amount of additional fishing mortality of monkfish and other bycatch species that would be expected to occur under this alternative, and assess the impacts of this additional mortality.
- Sections 6.2.1 and 6.2.2 group several decisions together and provide little or no comparative analysis between each alternative under those decisions. The discussion of impacts under summary headings (Stock Rebuilding Impacts, Impacts on Yield-Per-Recruit, etc.) does not alleviate the requirement to provide a proper analysis that explicitly distinguishes the biological impacts among the alternatives for each decision. For example, there are two alternatives for de-coupling DAS, one that would de-couple DAS by management area, and the other that does not restrict the de-coupling of DAS to one management area. The biological impacts of these two alternatives will likely differ, especially with respect to the potential to increase effort in the monkfish and NE multispecies fisheries. NEPA requires that the environmental effects of alternatives be presented in a comparative form to provide a clear distinction between the alternatives, and lend support to the selection of the preferred alternative.
- Section 6.2.1.1 - Stock Rebuilding Impacts
  - The second paragraph asserts that the combining of several alternatives may indirectly enhance monkfish stock rebuilding. Although the discussion in this section has been expanded, this claim is still largely unsubstantiated. At a minimum, a qualitative discussion should be provided to support the statements made in this section.

- The third sentence in the seventh paragraph states: "None of these alternatives would not have a significant..." The word 'not' should be removed. Further, this sentence goes on to state that the addition of limited access permits would not be significant because these vessels have been fishing under experimental fishery permits. However, the exempted fishing permits (EFPs), the permits issued for exempted experimental fishing activities, were issued for only one year and were limited to four vessels. Given the extremely limited scope of the experimental monkfish fishery, this reasoning should be removed. Instead, it is suggested that a discussion be included concerning the area and time constraints that will be placed on these vessels as a justification for why these impacts will not be significant. Furthermore, this section should cross-reference the table containing the number of vessels expected to qualify under each alternative in Section 6.4.8.

- Section 6.2.1.2 - The last sentence of the second paragraph in this section is unclear. This sentence states that taking no action on separating DAS usage requirements commensurate with the adoption of a 10-inch or 12-inch minimum mesh requirement would enable vessels to still target monkfish with the regulated NE multispecies minimum mesh. However, the paragraph does not explain why this would be the case, nor does it make a direct link to the impacts on yield-per-recruit. Please provide an explanation for this statement, and discuss the impacts of the No Action alternative on yield-per-recruit.
- Section 6.2.2.1 - General Considerations
  - In the third paragraph of this section, the statement that vessels are already targeting NE multispecies during those trips where they are required to use a NE multispecies DAS in conjunction with a monkfish DAS (under current regulations) should be backed up by landings data. Information from the Affected Environment section (Section 5.0) could even be crossed referenced here. In fact, all similar statements in Section 6.2 should be backed up by available data.
  - The statement that the trawl configuration alternative would reduce the monkfish trawl fishery's interaction with EFH of other species is not substantiated. This alternative is not fully developed; this is a strong statement to make without any type of qualitative discussion.
  - The discussion on the offshore SFMA fishery program in the sixth paragraph should include further explanation regarding how this fishery and the red crab fishery might overlap (e.g., provide some general background on where these two fisheries would occur, along with the status of the red crab resource).
  - The discussion regarding the NFMA trawl fishery in the seventh paragraph is extremely insufficient. This section should evaluate which groundfish species will likely be caught, the species' status and an estimate of total groundfish mortality. Because Amendment 13 placed strict limitations on the catch of some overfished groundfish species, it is important to discuss the impact the experimental fishery would have on any species of concern.
  - This section also needs to include a discussion of the impacts that could result from the exemption of monkfish DAS under the proposed DAS exemption program (DAS Research Alternative 2). In particular, this discussion should address any groundfish bycatch that would occur during these "additional" monkfish DAS.

- Section 6.2.3.2.1 - The anticipated effects of Alternatives 1a and 1b (de-coupling DAS), and Alternative 2 (no action) are not clearly stated in this section. In addition, the information in the third paragraph of this section suggests that any potential increase in monkfish fishing effort under Alternatives 1a and 1b would be mitigated by the anticipated reduction in NE multispecies DAS under Amendment 13 to the NE Multispecies FMP. However, there is no rationale provided to lend support to this statement. Although the overall negative effect of de-coupling DAS may be diminished as a result of DAS reductions in Amendment 13, the de-coupling of DAS under Amendment 2 could still have the effect of increasing fishing effort in the SFMA as compared to what would occur if DAS were not de-coupled.
- Section 6.2.4 - The inclusion of the cooperative research alternatives in this section as measures that will not likely have biological impacts is inappropriate. As stated previously, the impacts of additional monkfish effort under DAS Research Alternative 2 should be more thoroughly assessed.

Impacts on Essential Fish Habitat (EFH) (Section 6.3)

- We suggest that Sections 6.3.1.1.1 and 6.3.1.1.2 be eliminated, and that Section 6.3.1.1.3 be revised to reflect that Amendments 10 and 13 have been implemented, and that Frameworks 16/39 are under consideration.
- Section 6.3.1.3, EFH Alternative 3 - This section should discuss how the measures contained in other FMPs pertain to mitigating the adverse effects of the monkfish fishery on EFH. In addition, the tables utilized under this alternative and the other EFH alternatives should be consistent throughout the document, particularly where analyses and comparisons are made (discussion, analysis, and practicability). For example, Tables 81 and 89 are not quite the same.
- Section 6.3.1.4.1 - Since it is recommended that the No Action option under EFH Alternative 4 be eliminated, this section should be eliminated as well.
- Section 6.3.1.5 - The document describes the importance of deepwater corals, but it does not state why the Council is proposing to protect deepwater corals in this action. This section should cross-reference Section 6.3.2.6, which describes the re-establishment of a monkfish fishery in offshore deeper waters where deepwater corals are most likely to be encountered. It should also cross-reference the justification provided in Section 4.1.9.5 (see prior comment on this section).
- There should be a summary section at the end of the analysis of impacts for EFH alternatives that better compares and contrasts all of the habitat alternatives (i.e., a new Section 6.3.1.6), and clarifies what the impacts (positive or negative) would be relative to the status quo.
- Section 6.3.2.6 - The second paragraph in this section should be revised to include rationale for the coral protection alternatives (e.g., mitigation for the potential adverse effects on an expanding fishery in deepwater habitats on the continental slope).
- Section 6.3.2.9 – The last sentence of the third paragraph in this section states that both cooperative research funding program alternatives would have neutral effects on habitat, since they do not result in increased effort. However, the DAS exemption alternative would result in an increase in effort (through use of additional DAS beyond those allocated to the fishery) as compared to the status quo. Therefore, the potential habitat impacts of this additional effort should be discussed.

Economic Impacts (Section 6.4)

- It is recommended that some discussion of the longer-term economic benefits and costs of the proposed measures be developed and added to the document. The alternative to separate DAS could result in substantial longer term social and economic effects if this measure leads to an increase in the number of monkfish DAS used, and subsequent reduction in trip limits and/or DAS in accordance with the annual target TAC-setting method established in Framework 2.

Social Impact Assessment (Section 6.5)

- The discussion of impacts of the alternatives in this section needs to be further expanded. Supporting information does not back up many of the statements made in this section. In cases where there are little or no data available, limitations on data should be explained, and the logic behind the statements/conclusions should be provided.
- Much of the information contained in the forward portion of this section appears to be more suited to the "Affected Environment" section of the document. The information should then be cross-referenced in this section for the purpose of discussing the impacts of the alternatives on ports and communities.
- The first paragraph on page 348 references the fact that an analysis has not yet been conducted "to more definitively define either the magnitude or directionality of impacts." Will this analysis be conducted for the FSEIS? If not, this paragraph should explain why the analysis has not been conducted.

Cumulative Effects Assessment (Section 6.6)

- This section provides a brief summary of the impacts of the proposed action on all Valued Environmental Components (VECs) listed under Section 6.6.1 except for communities. A brief summary of the social and economic impacts of the proposed measures on communities should be included. Further, it is <u>critical</u> that the cumulative effects section discuss the possible long-term biological, economic, and social impacts that could result if it becomes necessary to further reduce monkfish effort as a result of increased effort from the measures adopted in this amendment. A discussion of any shifts in effort that may occur from the separation of DAS (i.e., scallop vessels directing on monkfish) must also be discussed.
- Section 6.6.6.1 - The statement that the stock is nearly rebuilt (second paragraph) is subjective and suggests that we have information on stock rebuilding trajectories (which we do not). It would be more accurate to indicate that the most recent 3-year average (for 2003) is about 19 percent below B_{target}.
- Section 6.6.7 - It is important that the reader understand what factors were considered to make the cumulative effects determination. It is suggested that the first sentence of this section be modified and an additional sentence be added to the introduction paragraph so that it better indicates how the conclusions regarding cumulative effects in Table 106 were reached. For example, "The following table (Table 106) summarizes the alternatives and the anticipated cumulative effects on each of the five VECs. The cumulative impacts determination is based on the preceding analysis of non-fishing actions, fishing gear effects, direct and indirect impacts resulting from the

various alternatives and the summary of past, present and future actions affecting the monkfish fishery."

Thank you for carefully considering these comments. My staff is available to discuss them with your staff, should they have any questions concerning this letter.

Sincerely,

Patricia A. Kurkul
Regional Administrator

Attachment

Attachment

Technical and Editorial Comments

1. A discussion of how DAS reductions under Amendment 13 to the NE Multispecies FMP impact the DAS separation alternatives should be contained in the document. For example, if Alternative 1a is selected (SFMA only alternative) how would this impact vessels that fish only in the NFMA that have fewer NE multispecies DAS than monkfish DAS as a result of Amendment 13.
2. The last sentence in Section 2.5.2.3, page 10, states that "most of the monkfish permit holders also hold multispecies limited access permits…." The percentage of monkfish vessels holding limited access NE multispecies permits should be inserted, and the sentence should reflect that this is referencing limited access monkfish permit holders. The revised sentence should read something like "most of the limited access monkfish permit holders (74 percent) also hold limited access NE multispecies permits…"
3. Update Table 2, page 15, to contain the trip limits for the fishing year 2004.
4. In section 4.1.2.3, this coordinate should read "72°30' W. Long.", not "71°30' N". Please make sure this coordinate is referenced correctly in other sections of the document.
5. Under Section 4.1.4.4, the second sentence should be clarified to read that the one of the previous alternatives would apply to vessels fishing on a combined (monkfish/multispecies or monkfish/scallop) DAS. As it currently reads, the sentence may confuse and/or to mislead the public to think that the proposed mesh sizes would apply to all other fisheries.
6. In Section 4.1.9, page 48, the first sentence in the fourth paragraph should reference Alternatives 5 AB and 5C. It currently only makes a reference to 'these alternatives'. In addition, it appears that this paragraph could be combined with the previous paragraph.
7. It appears that the reference to Figure 5 on page 52 is missing from the last sentence of the second paragraph under Section 4.1.9.5. The sentence should begin "Figure 5 depicts the location….."
8. Please eliminate the reference to "orange roughy" in Section 4.1.9.5 and in the other sections of the document discussing EFH impacts since this species only occurs in the Pacific Ocean.
9. Under Section 5.1.5.3, Figure 23 (Page 95) needs a key to the fill patterns for the Boesch (1979) study.
10. Section 5.1.7.2 - Protected Species Potentially Affected by this FMP
    - On page 107, under the heading *Right Whale*, information is available on the number of right whale calves born in the 2001/2002, 2002/2003, and 2003/2004 calving seasons as well as the number of known right whale deaths. This information is not necessary for the overall analysis of the effects of the proposed action on ESA-listed right whales, but the information should be up to date if it is to be included in the species summary.
    - Current large whale entanglement information for 2002 is available. This information should be included in Table 27 on page 112.

11. On page 119, in the first paragraph a typo "monkfishfishery" should be split into two words.
12. On pages 130 and 131, under the headings *Harbor Seal* and *Harp Seal*, the word "Artic" should be spelled "Arctic". In addition, a typo "monkfishs" under the heading *Harbor Seal* should be "monkfish".
13. Section 5.1.8 should also describe the importance of deepwater corals as habitat. Please include what is known and unknown about the functions and values of deep sea coral habitat.
14. On page 222, in the second to last sentence in Section 5.4.1.2, the reference to Table 73 appears to be incorrect. The Table 73 included in the document does not contain the information referenced in this section. Please delete or correct this reference.
15. On page 222, in the first sentence in Section 5.4.1.3, the reference to Table 74 appears to be incorrect. The Table 74 included in the document does not contain the information referenced in this section. Please delete or correct this reference.
16. On page 230, in Section 5.4.1.6, the word "other" in the first sentence of the phrase "bottom other trawls" should be changed to the word "otter".
17. Section 6.2.3.1 - In paragraph eleven of this section, sei whales are included in the list of species that may potentially become entangled in both trawl and sink gillnet gear. NOAA Fisheries is unaware of any known interactions between trawl or sink gillnet gear and sei whales. This reference should be deleted unless a source for the information can be provided.
18. It is confusing to have Section 6.2.4, which discusses measures that will have little or no biological impact, after the discussion on protected resources, and thus several sections removed from the biological impacts analysis. Section 6.2.4 should be moved and included between the discussions in 6.2.2.1, General Considerations, and 6.2.2.2, Skate Baseline Review Requirement.
19. On page 259, in Section 6.3.1.1.4, the typo "geras" in the second sentence should be changed to "gears."
20. One page 263, Section 6.3.1.3.1, the typo in "primarilt" in the sixth sentence of the last paragraph in this section should be change to "primarily.
21. On page 278, Table 84 is missing a reference under the heading "EFH Composition."
22. On page 297, please make the following edits:
    - In Section 6.3.3.3.2, the cross-reference to the section number for the Social Impact Assessment contained in the document should be corrected to read "Section 6.5."
    - In Section 6.3.3.3.4, some text should be added summarizing the information contained in Table 87. At a minimum, the text should reference this table, which is located on the following page.

THE MONKFISH DEFENSE FUND

July 26, 2004

RECEIVED
JUL 27 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Mr. Phil Haring
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950
via facsimile and first class mail

RE: Comments on Amendment #2 to the Monkfish FMP

Dear Phil:

Please accept the following comments on Amendment 2 to the Atlantic Monkfish FMP submitted on behalf of the Monkfish Defense Fund ("MDF"). The MDF leadership actively participates in all facets of monkfish management and cooperative scientific research efforts and represents monkfish fishermen and processors from Maine to North Carolina.

The specific MDF comments track the Council's "Public Hearing Document Amendment 2 to the Monkfish Fishery Management Plan" and references both "decision" item and page numbers.

Decision 1: Separation of DAS usage requirement on Category C & D vessels
MDF Position: Support DAS Alternative 2 (no action) with a proposed change. The MDF proposes that the Councils consider an incremental process to allow trawl vessels fishing in the SFMA offshore trawl area (see Decision 8) to decouple DAS for that specific fishery (i.e. not be charged a Scallop or Multispecies DAS when fishing in that area). We envision a process whereby permitted trawl vessels that historically targeted monkfish in the SFMA could decouple a specified amount of monkfish-only DAS to be used exclusively in the offshore area. We also request the Council consider using an incremental approach to this process that would effectively limit the number of vessels and cap the initial effort (DAS, number of trips) that could be used in the offshore area to ensure that the SFMA stock is not severely impacted. The DAS/trips allowed in the offshore fishery could be adjusted upwards consistent with stock rebuilding.
MDF Rationale: The MDF continues to support participation by monkfish trawl vessels in the SFMA. However, there are concerns that immediate full-scale DAS decoupling will lead to a large influx of fishing effort throughout the SFMA. Considering that the stock in the SFMA was only recently characterized as "no longer overfished", and the DAS allocation for vessels in the SFMA fixed gear category was reduced from 40 to 28 for the current fishing year, we believe additional effort is not advisable at this time.

We strongly urge the Council consider an incremental process that would protect the stock and provide trawl vessels with the flexibility to decouple DAS only when participating in the proposed offshore trawl "exemption" area (see Decision 8). The MDF also believes the fishery dependent information from the offshore area will greatly enhance the monkfish stock assessment process.

Decision 2: Adjustment of the 50 lbs. (tail wt.) incidental catch limit
MDF Position: Support Incidental Catch Alternative 2 (preferred) – 50 lbs. (tail wt.) per day, up to a maximum of 150 lbs.
MDF Rationale: This alternative will reduce monkfish discards, improve monkfish catch statistics, and augment the information used to conduct stock assessments.

Decision 3: Incidental catch limit on General Category Scallop vessels and Surf clam/Ocean quahog dredge vessels
MDF Position: Support Alternative 2 (preferred) – 50 lbs. tail wt possession limit, per day, up to a maximum of 150 lbs.
MDF Rationale: This alternative will reduce monkfish discards, improve monkfish catch statistics, and augment the information used to conduct stock assessments.

Decision 4: Incidental catch limit on Summer Flounder vessels west of 72 degrees 30 minutes west
MDF Position: Support Alternative 2 (preferred)
MDF Rationale: This alternative will reduce monkfish discards and restore the incidental catch limit to what it was in the original FMP.

Decision 5: Minimum mesh size on monkfish trawl vessels
MDF Position: Support Alternative 1 (no action, preferred).
MDF Rationale: An adjustment to the mesh size will negatively impact the ability of trawl vessels to catch other species. The MDF suggests the Council first attempt to address discards via incidental harvest limits rather than through more invasive actions such as gear mitigation. The MDF also reminds the Council and NMFS to ensure the proper wording of the regulation such that whatever the specific codend size available on the market is the permissible metric.

Decision 6: Minimum fish size
MDF Position: Support Alternative 2 (preferred) - uniform fish size in both areas; Alternative 2 Option 1 for 11-inches (tail) and 17-inches (whole).
MDF Rationale: The MDF supports this alternative for trawl vessels fishing in the SFMA offshore trawl exemption area (see Decision 8). The MDF continues to support a 14-inch (tail) and 21-inch (whole) size limit for fixed gear vessels in both areas fishing on a monkfish-only DAS.

Decision 7: Closed Season (block of time out of the fishery)
MDF Position: Support Alternative 2 – eliminate the requirement to take a 20-day block out of the fishery on monkfish limited access vessels.

MDF Rationale: The current state of scientific information suggests monkfish exhibit temporally and spatially protracted spawning behavior. In addition, preliminary evidence from the recent monkfish trawl survey indicates large numbers of small monkfish. Hence, there does not appear to be strong support for a spawning closure at this time. In addition, it is important to note that fixed gear, limited access vessels targeting larger monkfish are already subject to a mandatory 20-day closure during April 1-20 pursuant to the Harbor Porpoise Take Reduction Plan. A requirement to take an additional 20-day block out of the fishery is difficult to justify at this time.

Decision 8: Offshore Southern Management Area Fishery Program
MDF Position: Support Alternative 2 (preferred); Offshore Area Option 1; Season dates October 1 – April 30; Trip limits/DAS Option 2; with a suggested change.
MDF Rationale: The MDF supports the creation of an offshore SFMA fishery with trip limit flexibility designed to provide for economical trips. However, as stated in the rationale section under **Decision 1**, the MDF requests the Council proceed carefully and incrementally with respect to developing the offshore fishery. We strongly urge the Council consider allowing access to historic participants and initially limit the number of DAS/trips that can be used in this area.

Decision 9: Modification of permit qualification criteria for vessels fishing south of 38 degrees North
MDF Position: Support Alternative 3 (preferred by MAFMC)
MDF Rationale: The MDF supports inclusion of vessels qualifying under this alternative in the southern portion of the SFMA based on the facts that these fishermen were not part of the initial permitting process, did not receive adequate permit notification, and were unfairly confused by the initial public information which contained inconsistencies pertaining to the geographic range of the fishery.

Decision 10: Exemption for vessels fishing for monkfish in the NAFO Regulated Area (outside the EEZ)
MDF Position: Support Alternative 2 (no action)
MDF Rationale: The MDF does not believe there is sufficient evidence or need to implement the preferred alternative at this time. In addition, there is some concern over potential international complications should a fishery develop in the NAFO area.

Decision 11: Alternatives to minimize the impact of the fishery on EFH
MDF Position: Support combined Alternatives 1 & 3
MDF Rationale: The MDF supports those actions that are necessary to protect monkfish EFH. The Amendment 2 document indicates the "Gear Effects Determination" of the DSEIS concluded that monkfish EFH is not vulnerable to the effects of fishing. Therefore, no additional measures are necessary to protect monkfish EFH at this time. Furthermore, we respectfully request the Council consider recent management actions pursuant to FMP's for other species that may provide some benefit for monkfish EFH.

Finally, because of the ubiquitous nature of monkfish across many habitat types, we do not believe deep-sea coral fits the definition of EFH for monkfish in that deep-sea coral is not believed to be "necessary for spawning, breeding, feeding or growth to maturity." {See MSFCMA 16 U.S.C. 1802; Section 3 (10)}. Also, there is no evidence to indicate that monkfish fishing activities adversely effect EFH in a manner that is more than minimal and not temporary in nature, as required by the current EFH guidelines {See 67 FR 2354}. Therefore, insofar as Monkfish Amendment 2 is concerned, Alternatives 4 and 5 exceed the Council's EFH responsibilities pursuant to MSFCMA Section 303(a)(7) and the guidelines established under Section 305(b)(1)(A).

Decision 12: Cooperative research program incentives

MDF Position: Support both Alternatives 1 (preferred) & 2

MDF Rationale: The MDF membership is very supportive of cooperative research. Many MDF members and staff have a history of direct involvement in various research activities. We support both alternatives, believing they will streamline the process, ensure the Council(s) has a prominent role, and will provide maximum flexibility at minimal cost for vessels interested in participating in future research efforts.

Decision 13: Vessel upgrading baseline (dual baseline)

MDF Position: Support Alternative 2 (preferred)

MDF Rationale: For purposes of clarity and simplicity, the MDF supports the application of a single vessel permit baseline set at the length, tonnage and horsepower specifications of the first limited access permit applied to the vessel.

Decision 14: NFMA trawl experimental fishery

MDF Position: Support Alternative 2 (preferred)

MDF Rationale: The MDF has a strong history of supporting scientific research and field investigations designed to improve our understanding of monkfish biology and to provide for sustainable commercial access to the monkfish resource. As such, we strongly support Alternative 2 and encourage the Council and the Agency to work with interested parties to initiate/complete the 2-year experiment.

Decision 15: Change the fishing year start date

MDF Position: Support Alternative1 (no action, preferred)

MDF Rationale: The MDF sees no viable justification for changing the start date of the fishery at this time. The preferred alternative provides for the shortest time period between data availability and the process used to set TAC's and trip limits.

Decision 17: Modify the framework adjustment procedure

MDF Position: Support Alternatives 2 & 3

MDF Rationale: The MDF recognizes the need, at times, for a proactive, expedited framework amendment process designed to implement gear-specific requirements to address urgent management issues.

On behalf of the members of the Monkfish Defense Fund, thank you for the opportunity to comment on Monkfish Amendment 2.

Respectfully submitted,

Marc Agger / REM

Marc Agger
Monkfish Defense Fund

cc. Dan Furlong, Executive Director, MAFMC

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JUL 2 7 2004
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MANAGEMENT COUNCIL

"Monkfish Amendment 2 comment" Related to de-coupled DAS , specifically preferred Alternative 1

The DAS Alternative 1 (preferred) with de-coupling DAS from Scallop and Multispecies DAS. Has the potential of having a huge negative effect on both the monkfishery and the Multispecies DAS. WE are going to be adding effect to both fishery, which will ultimately give both less DAS to fish and lower limits on Monkfish.

Right know in the Southern New England Area we already have very few DAS at sea for monkfish with small limits. If you increase the effect on monkfish in this area you will be butting many fishermen out of business. Many of these fishermen have just lost there DAS or have C days because the were targeting monkfish. So they do not have any other options.

This Alternative one will also have a negative effect on everyone's DAS because it will allow fishermen like myself to ether use all my DAS (instead of using the up on Monkfish DAS or leasing them out and also continuing to monkfish.

One Decision in amendment 2 is developing and monkfish B day into the fishery. This I think would be a better alternative because it will protect the fishery better, at the same time giving fishermen the opportunity to access the Monk Fishery without using up the few and valuable A day.

We must also That a close look at Decision 11 within this document that pertains to the black coral that are currently under the EFH. Adopting measures without having scientific reasoning and a full understanding could be detrimental to our fishing communities.

We cannot continue to raise effect without losing DAS and having smaller limits. For this reason we should adopt alterative 2 (NO Action).

Thank You for giving me the opportunity to comment.

Sincerely,
John J O'Leary
F/V Capt Bligh
NSC board Member

NORTHEAST SEAFOOD COALITION

July 28, 2004

RECEIVED
JUL 28 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

TO: Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

RE: Comments on Amendment 2 to the Monkfish Fisheries Management Plan

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The Northeast Seafood Coalition (NSC) appreciates the opportunity to comment on the proposed measures to the Monkfish Fishery Management Plan (FMP). The following comments are meant to reflect the management measures that were recently adopted in Amendment 13 to the Northeast Multi-species FMP as well as the pending framework adjustment to Amendment 13, known as Framework 40A. NSC's comments also address the need for the proposed essential fish habitat measures contained within the Monkfish FMP to mirror the current Habitat Omnibus process that the New England Fishery Management Council ("Council") is currently executing.

As of today, permit category C and D vessels, are required to use a scallop or multi-species day at sea (DAS) when fishing on a monkfish DAS. Decision 1, in the public comment document, proposes monkfish DAS to be separated, or "de-coupled", from the multi-species and scallop DAS. Although this concept of separating the DAS was meant to provide the industry with flexibility, in actuality, the de-coupling has the potential to increase effort in both the multi-species and monkfish fisheries.

With such increased effort comes the potential for future DAS reductions in both the monkfish and multi-species DAS. For example, as quoted from the public document, "if monkfish fishing effort were to increase (as a result of the separation of DAS usage requirements) to a level that is inconsistent with the rebuilding program, measures are already in place that would reduce trip limits and/or allocated DAS." In addition to reducing DAS, such effort could also adversely affect the market prices for species managed under both fishery management plans.

Recognizing that the development of this Amendment occurred prior to the adoption of Amendment 13 to the Multi-species FMP, the relatedness of the monkfish and groundfish fisheries (vessels and permits) and the costs associated with increased effort, NSC strongly recommends that the DAS are kept linked. NSC believes the alternative to de-coupling that doesn't jeopardize the rebuilding plans of either FMP is provided within the present structure of the Multi-species FMP and pending framework adjustment 40A.

With the May 1st implementation of Amendment 13 came a new category of DAS known as the healthy stock days or "B-days." As previously mentioned, the New England Fishery

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Management Council ("Council") adoption and implementation of the "B" day classification in the Multi-species FMP was subsequent to the process that developed the present Monkfish (DEIS) and options for Amendment 2 to the Monkfish FMP. NSC strongly believes that many, if not all, concerns that prompted the need to create a decoupling option could now be addressed through the utilization of "B" days for multi-species permit holders.

This approach (continued linking through use of "B" DAS) would also substantially reduce the potential for shifts in effort and the creation of a program (de-coupling) that could facilitate **new directed effort participants** in both the multi-Species and monkfish fisheries. The results of these shifts and newly created directed fishery opportunities would produce a myriad of negative impacts to those currently and traditionally engaged in either the directed multi-species or monkfish fisheries, those who are currently dependent upon one of these separate fisheries.

NSC recognizes the concerns of fishermen in the SFMA who fear the potential of future loss of limited access status as a result of the low trip limits in that area. For this reason, NSC supports the Offshore Program DAS/trip limits, Option 1 in Decision 8, that would allow a permit holder to convert a higher amount of low trip limit, Monkfish DAS into a lower of amount of higher trip limit DAS. This provision, combined with the utilization of Multi-species "B" regular DAS, may offer sufficient economic opportunity for some vessels to have a limited directed fishery that could produce some marginal economic benefit and historical landings to preserve their limited access status in the future.

Additionally, by continuing a program that links multi-species DAS to the use of monkfish DAS, trawl gear advances in technology through research could be facilitated and accelerated through the use of "B" regular DAS while accounting for all groundfish bycatch through the closely monitored programs being developed. The loss of multi-species DAS while conducting gear research has been a hindrance to advancing gear technology development. The "B" DAS offer the potential to allow fishermen to conduct their own gear modifications and collaborative research without loss of primary "A" DAS as well as working under a program that allows a limited and accountable bycatch of other species, unlike many experimental fishery permits.

The Coalition believes such a program would provide the additional DAS needed for permit holders while maintaining the goals of rebuilding and minimizing the potential for additional DAS reductions in the fleet.

Lastly, Decision 11 within the public comment document holds a series of alternatives proposed for essential fish habitat measures. In light of the Omnibus Habitat Amendment process that is presently moving forward, NSC urges the Council to proceed cautiously when adopting certain measures to the Monkfish FMP that are outside of this process and that could potentially be outside of the Council's authority. This comment specifically relates to the options pertaining to deep sea corals that are not currently under the essential fish habitat

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definition under the 1996 Amendments to the Magnuson-Stevens Fishery Conservation and Management Act.

There is much to be learned about the importance and significance of deep sea corals to essential fish habitat. Adopting measures without having scientific reasoning and a full understanding of their importance could be detrimental to our fishing communities. NSC strongly believes that management measures should be based upon sound science and legislation. Neither of which, NSC believes at this point, exists in this case.

Thank you again for the opportunity to comment on the proposed management changes to the Monkfish FMP.

Sincerely,

Jacqueline Odell

Jacqueline Odell
Executive Director

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DEPARTMENT OF
MARINE RESOURCES
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AUGUSTA, MAINE
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JOHN ELIAS BALDACCI
GOVERNOR

GEORGE D. LAPOINTE
COMMISSIONER

by fax 7/28/04

July 28, 2004

RECEIVED
JUL 2 8 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Paul Howard
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Re: "Monkfish Amendment 2 Comment"

Dear Paul:

We have reviewed the Public Hearing Document on Amendment #2 to the Monkfish Plan and offer the following comments:

We concur with the Amendment #2 goals and objectives as outlined in the Public Hearing Document to reconsider the limited entry program for the fishery south of 38 degrees; address deepwater fisheries problems; address DAS issues associated with scallop and multispecies limited access vessels; and address Magnuson Act requirements for EFH, bycatch, and protected resources/fishery interactions.

We support the Amendment #2 approach to continue the stock rebuilding program adopted under Framework 2, including the plan's biological reference points and method for setting annual catch targets, trip limits, and DAS adjustments. While stock rebuilding is essentially on schedule, we are concerned that decoupling monkfish DAS from scallop/multispecies DAS will increase effort on the monkfish resource which could affect stock rebuilding over the long term. Such an increase in effort could require adjustments in trip limits, incidental catches, or other restrictive measures that will impact participants in the monkfish fishery. If DAS are separated, use of large mesh trawl and gillnet gear will increase. This could result in increased bycatch of large cod, skates, red crab, and possibly Atlantic sturgeon as well as other protected species. If DAS are separated, the Council should urge NMFS to increase observer coverage of this expanded large mesh fishery for which there is currently little bycatch data. The Council should also recommend to the NMFS that they encourage and support industry experimental fisheries to identify time/area restrictions that minimize bycatch while targeting monkfish only. We note that the document contains a good range of alternatives to address DAS issues such as leasing, transfers, and separating DAS usage.

We commend the staff on the development of a wide range of practical alternatives that will minimize the impact of the monkfish fishery on EFH. We support preferred alternatives 4 or 5 which address trawl gear configuration requirements, roller gear restrictions, or area closures to specific gear types to protect deep-sea coral areas.

Thank you for the opportunity to provide these preliminary comments on the PHD for Amendment #2. We look forward to working with the Council on its approval and implementation.

Sincerely,

George D. Lapointe
Commissioner

OCEANA

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July 28, 2004

Ms. Pat Kurkul
Regional Administrator
Northeast Region
NOAA Fisheries
One Blackburn Drive
Gloucester, MA 01930-2298

Mr. David Borden, Chairman
New England Fishery Management Council
50 Water St., Mill 2
Newburyport, MA 01950

RE: Comments on Amendment 2 to the Monkfish Fishery Management Plan (FMP) and its Draft Environmental Impact Statement (*69 Fed. Reg. 23751 (2004)*)

Dear Ms. Kurkul and Mr. Borden:

Thank you for the opportunity to submit these comments concerning Amendment 2 to the Monkfish Fishery Management Plan and its Draft Environmental Impact Statement (FEIS). Oceana is an international advocacy organization, with over 200,000 active supporters worldwide (8,000 residing in New England states), that is dedicated to restoring and protecting the world's oceans. Oceana has actively participated in the New England Fishery Management Council's ("New England Council" or "Council") development of Monkfish Amendment 2 since 2002 and has proposed alternatives to protect sensitive deep-sea coral habitats, to minimize the adverse impacts of fishing on hard-bottom gravel areas, and to deploy adequate levels of observer coverage to accurately assess bycatch in the monkfish fishery. Oceana has also petitioned the Secretary of Commerce to designate deep-sea corals as EFH and HAPCs and protect them from the adverse effects of fishing gears throughout federal waters. *See* Oceana HAPC Petition, [Attachment I]. Please consider these comments in your deliberations on Monkfish Amendment 2 during the September Council meeting.

In short, we urge the Council to take the following actions as it considers Monkfish Amendment 2: (1) Establish deep-sea coral protection zones in Oceanographer and Lydonia Canyons that prohibit monkfish bottom-trawling; (2) include specific measures to protect hard-bottom, gravel habitats from bottom-trawling; and (3) adopt necessary bycatch reporting requirements in all sectors of the fishery and take effective actions to reduce known bycatch occurring in the fishery.

Oceana applauds the New England Council's proactive efforts to protect deep-sea corals ecosystems in New England waters. Deep sea corals typically are extremely slow-growing and may live for hundreds of years. Consisting of both reef-like structures and thickets, they provide habitat for numerous fish and invertebrate species. As a result, corals are essential parts of larger communities of sponges, sea anemones, fish, shellfish, and a wide diversity of other species. In fact, scientists researching deep-sea coral gardens in New England and in other regions have compared their high levels of biodiversity to shallow-water coral communities in the Western Pacific and in other tropical marine areas.

Scientists have recently discovered over fifteen species of deep-sea corals occurring in New England inshore and offshore waters, including the gorgonian corals *Primnoa* and *Paragorgia arborea*. These two species of corals, more commonly known as red trees and bubblegum coral, can form great branching trees that reach many feet from the seabed. Red tree corals seven feet tall and 25 feet wide have been observed by scientists in submersibles, and fishermen have reported bubblegum corals over ten feet tall and several inches thick. Both species are found in the depths of the North Atlantic and North Pacific oceans, from 100 to over 2,500 feet deep. The bubblegum coral has been found in waters deeper than 4,300 feet. Numerous commercially and non-commercially managed species are known to use red tree corals as both food and habitat. Economically important rockfish, halibut, Pacific cod, shrimp and crabs hide among the branches, seeking protection. Crinoids, basket stars, anemones and sponges attach themselves to dead branches so they may better filter food from nutritious currents. Other animals, such as sea stars and snails, feed directly on the corals themselves.

According to the National Marine Fisheries Service ("NOAA Fisheries" or "Fisheries Service") scientists, deep-sea corals serve many important purposes, including:

- Habitat for unique and diverse fish and invertebrate communities;
- Important indicators of past climates. According to NOAA Fisheries, dead deep-sea coral skeletons have been radiocarbon dated to be greater than 40,000 years old; and
- Potential future sources of novel bio-compounds for development of pharmaceutical and biotechnology industries.

See NOAA Fisheries' Deep-sea Coral Briefing Document [Attachment II], at 2.

Outside of the United States, many countries have already acted to protect deep-sea corals resources within their jurisdictional waters. For example,

- In January 2003, Norway banned all bottom trawling along the Sula Ridge, creating Europe's largest deep-sea coral protected area;

- Ireland has mapped offshore waters under its jurisdiction from 200m to 4000m in part to identify key deep-sea coral habitat areas for future protection;
- In June 2003, Canada prohibited all bottom trawling in a 428 square kilometer deep-sea coral area off Nova Scotia;
- In August 2003, the European Union closed an area off Scotland – the Darwin Mounds – to bottom trawling to protect deep-sea corals.

Unfortunately, the United States is far behind these countries in terms of protecting deep-sea coral resources within their jurisdictional waters. In recent years, the South Atlantic Fishery Management Council is the only regional council that has implemented specific "on-the-water" measures to protect deep-sea corals from bottom trawls. However, at a time when efforts to protect deep-sea corals in most other regions of the United States are non-existent or in their fledging stages, we applaud the New England Council for its proactive efforts to develop viable alternatives for deep-sea coral protection and its continued public support for such protections. As a result, we now have one of the first opportunities to protect deep-sea corals in United States waters here in the Northwest Atlantic. We urge the New England Council to continue its resolve and commitment to implement lasting protections for New England deep-sea corals.

1. Deep-sea corals need immediate protection

Corals are clearly sensitive to fishing gear impacts and recovery rates are extremely slow based on our knowledge of recruitment, growth rates, and age structure. NOAA, along with numerous scientists around the world, has identified bottom trawling as a major threat to deep-sea coral ecosystems. See NOAA Briefing Document, Attachment II at 7. During the last meeting of the American Academy for the Advancement of Science in British Columbia, Canada, over 1,100 scientists from around the world were signatories to a letter expressing the need to protect deep-sea corals from bottom-trawling, which can remove significant amounts of corals in just one pass. *See* attached Scientist Letter, [Attachment III]. Documented evidence of the effects of trawling on deep-sea corals exists from the North Pacific, Canada and around the world, and shows that trawling results in long-term and likely permanent damage to long-lived, deep-sea coral ecosystems. Once damaged, deep-sea corals can take hundreds of years to recover. In some cases, deep-sea corals may never recover.

2. Monkfish Amendment 2 should include measures to protect deep-sea corals

The NEFMC should implement deep-sea coral protection in Monkfish Amendment 2 because:(1) monkfish trawling operates in deep water areas where corals occur; and (2) Monkfish Amendment 2 is proposing to re-initiate and expand the directed offshore monkfish trawl fishery.

According to the DEIS, the monkfish trawl fishery is one of the few fisheries that operate at depths where deep-sea corals have been identified. DEIS at 48. In 1999 and 2000, monkfish trawling was reported to have occurred around known deep-sea coral ecosystems within Oceanographer and Lydonia Canyon – with several trips actually occurring in deeper water than the proposed closures. DEIS at 225. As there is a overlap in the footprint of the offshore monkfish trawl fishery and the depth range of deep-sea corals, there is a real potential that economic incentives and technological advances will allow trawling to extend into the deep-sea coral ecosystems within these two canyons and other canyons in the near future.

Furthermore, it is appropriate to include coral protection at this time because Monkfish Amendment 2 proposes to re-initiate and expand the directed offshore monkfish trawl fishery – an action that may exacerbate the interaction between the trawl fishery and deep-sea corals. Both of the proposed offshore exemption areas encompass numerous deep-sea canyons, which are known to contain corals, or may contain corals. As Monkfish Amendment 2 states, re-establishing the offshore directed monkfish trawl fishery will lead to an "increased probability of fishing effort near deepwater canyons, which could increase interactions with deepwater corals." DEIS at 52. If coral protections are not implemented simultaneously with the measures proposed in Monkfish Amendment 2, then this expansion will occur without the necessary protections to deep-sea corals. As it may take years before NOAA Fisheries or the Council implement deep-sea coral protection (likely as part of the Omnibus EFH Amendment, presently scheduled for implementation in 2008), the expansion of the trawl fishery can cause significant damage to corals during the interim. This is credible evidence in favor of implementing deep-sea coral protection measures at this time as part of Monkfish Amendment 2.

3. Oceana supports Alternative 5AB – Oceanographer and Lydonia Canyons Closure

For these reasons, as a crucial first step, we urge the New England Council to maintain its commitment to protecting deep-sea corals under Monkfish Amendment 2 and support the implementation of Alternative 5AB as the Council's final alternative. Alternative 5AB would establish deep-sea coral closures in both Oceanographer and Lydonia Canyon to monkfish trawling. This alternative protects high concentrations of deep-sea corals that were recently mapped in 2002 by Dr. Peter Auster and Dr. Les Watling. *See* DEIS at 133, Figure 25; DEIS at 275, Figure 79. As scientists conduct more research and mapping efforts in other deep-sea canyons in the near future, the New England Council should ensure that there is a process for quickly protecting newly-identified deep-sea coral gardens from damage by fishing practices, in a comprehensive manner.

Alternative 5AB is a practical alternative because there has been no reported directed offshore monkfish trawling effort in the proposed closures. Therefore, there is virtually no current economic impact to the monkfish fishery. However, as noted by Monkfish Amendment 2, offshore monkfish trawling has occurred throughout the areas outside these proposed closures, and can likely occur in these canyons once the Council re-initiates the offshore monkfish trawl fishery. Installing protective measures before the monkfish trawl fishery becomes established in these areas reduces the cost of such protections when compared to re-directing monkfish trawling effort after the fact. In sum, implementation of Alternative 5AB will result in significant protection of these deep-sea coral communities at a time when the economic impact will be minimal.

4. Legal Authority to Protect Deep-Sea Corals

Present efforts to protect deep-sea corals in New England waters are a first. Naturally, there have been discussions during past Council meetings about the procedure and proper statutory authority to protect deep-sea corals. Some have even expressed concern that the New England Council does not have authority to protect deep-sea corals.

Those concerns are not warranted. In fact there is ample statutory authority under the Magnuson-Stevens Act and other federal environmental laws to protect deep-sea corals at this time. It is important that NOAA Fisheries and the New England Council articulate the basis they select for protecting coral and authority for protecting coral in final rule. For this reason, Oceana outlines present statutory authorities that the New England Council may use to justify protecting deep-sea corals at this time under Monkfish Amendment 2.

Existing statutory authorities that support the New England Council's proposed actions to protect deep-sea coral protection include: (1) the Essential Fish Habitat provisions (EFH) of the Magnuson-Stevens Act; (2) the bycatch provisions of the Magnuson-Stevens Act; (3) the discretionary provisions of the Magnuson-Stevens Act; (4) the Coral Reef Protection Executive Order 13089; and (5) the National Environmental Policy Act. As seen by the following discussion of each of these legislative authorities, the Council has broad legal authority to take the necessary steps to protect deep-sea corals.

Protecting Deep-sea coral habitats under the EFH provisions of the Magnuson-Stevens Act

The New England Council has broad discretion to protect deep-sea corals as either EFH for a managed species, or as habitat that should be protected from fishing for its own sake. Studies have shown that deep-sea corals act as essential fish habitat for numerous commercially- and non-commercially managed species. In fact, the North Pacific Council, the Western Pacific Council, and the South Atlantic Council have already designated deep-sea corals as vulnerable Essential Fish Habitat and as Habitat Areas of Particular Concern. NOAA Fisheries has approved these findings in each of the regions.

Protecting Corals as EFH for Redfish, Tilefish and Atlantic Halibut

In New England, deep-sea corals occur within areas designated as EFH, including Oceanographer and Lydonia Canyon, the areas to be protected in Alternative 5AB. Oceanographer and Lydonia Canyon are designated EFH for Atlantic halibut, Acadian redfish, red crab, and tilefish – all of which, except red crab, are severely overfished. All three species of fish have a documented association to physical and biogenic structure, including corals, cereanthids, sponges and boulder reefs in deep-sea habitats.

Furthermore, many of their prey species are found in areas of high biogenic structure, including deep-sea corals and boulder reefs. For this reason, the New England Council can protect areas with recently discovered deep-sea corals in Oceanographer and Lydonia Canyon and their associated coral communities as EFH for each of these overfished species.

Quite simply, the deep-sea corals in Oceanographer and Lydonia Canyon are *already* designated as EFH, because Oceanographer and Lydonia canyon are designated as EFH, and the designation extends from the seafloor through the water column. The fact that deep-sea corals are not specifically listed or specified in the EFH description and designation for these species[1] is irrelevant with regard to the duty of the Council and the Fishery Service to minimize adverse impacts to EFH to the extent practicable. According to existing regulations, once an area is designated EFH, the Council and NOAA Fisheries must minimize *any* adverse effect caused by fishing that is more than minimal and not temporary in nature. The Council and the Fisheries Service have determined that bottom-trawling adversely affects each of these EFH. It is undisputed that damage to deep-sea corals by trawling is long-lasting (if not permanent) and significant (The removal of corals will entirely alter the existing ecosystem depending on the corals.). For these reasons, the Council has both authority and a duty to minimize such adverse impacts to the extent practicable. It cannot be stressed too much that the area that is subject to Alternative 5AB is designated as EFH and that therefore, MSA, requires the Council to protect this habitat from adverse effects of fishing gear, regardless of the fact that deep-sea corals are not specifically included in the EFH description.[2]

Protecting corals areas as EFH for a non-managed species
The Council can protect deep sea corals as habitat under the MSA. Because deep-sea corals are included in the definition of "fish" under the Magnuson-Stevens Act, the NEFMC also has discretionary authority to protect these rare, long-lived, and fragile

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[1] This is only due to the fact that: (1) deep-sea corals were only recently discovered and researched by scientists in the past several years – after the last EFH designations process that concluded in 1999; and (2) the scope of EFH designations were limited by the methodologies used at the time. Recent studies conducted by Dr. Watling and Dr. Peter Auster have shown high concentrations of fish and prey species, including redfish, around deep-sea corals. Watling et al. (2003) and Auster (in press). It is very clear that if these studies were available prior to 1999, such presence/absence data would have likely been used to further support the designation of these deep-sea coral areas as EFH. In fact, all other EFH designations made in 1999 were based mainly on presence/absence data. As Dr. Watling notes, Watling et al. (2003), "*Clearly observations of high densities of fishes in coral habitats are consistent with predictions of use of "essential" habitats from frequency-dependent habitat use models.*"

[2] It is also important to note that deep-sea corals are included in the definition of "fish" under the Magnuson-Stevens Act. 16 U.S.C. § 1802(12). By extending monkfish activities into areas of deep-sea corals, the Council is implicitly authorizing "fishing" for deep-sea corals within the meaning of the MSA, *see* 16 USC sec 1802 ("Fishing" defined as ". . . any other activity that can reasonably be expected to result in the catching, taking, or harvesting of fish . . ."). Due to the vulnerable and rare nature of deep-sea corals, conservation measures are necessary in order to prevent depletion, overfishing, and possibly even extinction. For this reason, the Council has authority to manage deep-sea corals as necessary, and to designate deep-sea corals as EFH.

habitats for their own value - irrespective of the role deep-sea corals play with respect to managed species. Under Sec. 600.805(b)(1) – "An FMP may describe, identify and protect the habitat of species not in an FMU; however, such habitat may not be considered EFH for the purposes of section 303(a)(7) and 305(b) of the Magnuson-Stevens Act."

NMFS, in its Response to Comments on the EFH regulations, clearly sided in support of this authority, as seen in Comment C (67 FR 2348 (2002));

> Comment C: One commenter said that NMFS should delete from Sec. 600.805(b) the language saying that a Council may describe, identify, and protect the habitat of species not in a fishery management unit, but such habitat may not be considered EFH. The commenter said that under the Magnuson-Stevens Act, Councils may only develop FMPs for identified species and may not describe, identify, or protect the habitat of other species. The commenter also said that Councils have no authority under the Magnuson-Stevens Act to protect the habitat of any fish.
>
> Response C: The preamble to the interim final rule at 62 FR 66534 notes that the Magnuson-Stevens Act does not preclude Councils from identifying habitat (other than EFH) of a fishery resource under its authority even if the species is not managed under an FMP. Council actions to protect the habitats of managed or non-managed species is limited to protecting habitats from fishing activities.

Therefore, the Fisheries Service has clearly interpreted existing statutory authority to support the New England Council's ability to protect of habitat of non-managed species. These legal regulations are legally binding on the agency, and reflect the agency's official interpretation of the MSA, of which it is afforded deference under existing law.

Minimizing bycatch of deep-sea corals

The NEFMC also has broad discretion to implement area-based gear restrictions in deep-sea coral areas to minimize the bycatch of deep-sea corals to the extent practicable. 16 U.S.C. 1851(a)(9) and 1853(a)(11). According to the Magnuson-Stevens Act, deep-sea corals are included in its definition of "fish." MSA Sec. 3, 16 U.S.C. 1802(12). Therefore, deep-sea corals are species within the definition of "bycatch" under the Act and the NEFMC and NMFS have authority to regulated fishing in order to reduce bycatch of deep-sea corals.

The Fisheries Service has interpreted existing statutory authority to support the New England Council's broad statutory authority to reduce bycatch of deep-sea corals, as well as other non-commercially managed species. As seen in the Fisheries Service's Response to Comments on the National Standard One Guidelines, bycatch includes marine species with no commercial value:

> *Comment 4*. One commenter observed that national standard 9 applies not only to commercially valuable species, but also to all finfish, shellfish, and invertebrate species with no commercial value.
>
> *Response*. NMFS agrees. The definition of ''fish'' in the Magnuson-Stevens Act includes finfish, shellfish, and invertebrate species, and all other forms of marine animal and plant life except marine mammals and birds; by extension, bycatch applies to these forms of marine life.

See. 63 FR 24224 (1998)(National Standard One Guidelines). These legal regulations are legally binding on the agency, and reflect the agency's official interpretation of the Magnuson-Stevens Act, of which it is afforded deference under existing law. In sum, the NEFMC can take action under Monkfish Amendment 2 to implement Alternative 5AB as a measure to minimize bycatch[3] of deep-sea corals.[4]

Protecting deep-sea corals under the discretionary provisions of the Magnuson-Stevens Act.

Independent of any other authority, the Council has broad discretion to regulate fishing and close areas to fishing, as long as this action is consistent with National Standards and other applicable law. Under 1853(b) of the Magnuson-Stevens Act - "Discretionary Provisions" - NMFS and the New England Council may "designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear." Sec. 303(b)(2), 16 U.S.C. Sec. 1853(b)(2). Therefore, the New England Council can create, and regulate certain fishing activities, in deep-sea coral protection areas. [5]

Supplemental statutory and legal authority to protect deep-sea corals

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[3] There is scientific support for this approach. *See* Auster (in press)("If convincing data about the use of coral habitats by fishes of economic importance are lacking, there are clear directions for conserving corals based on bycatch reduction goals, or to reduce the potential for coral taxa being listed as an endangered or threatened species (with concomitant draconian management measures to insure their survival). For species with extremely long population recovery times, precautionary management strategies are a clear benefit.")

[4] Suggestions that the Council can not re-characterizing existing EFH measures to protect deep-sea coral closures in Monkfish Amendment 2 as bycatch measures due to public notice and comment requirements are unfounded. In fact, Monkfish Amendment 2 already specifies that the deep-sea coral protection measures are under consideration as measures that may also be implemented in order to satisfy the Magnuson-Stevens Act's requirement to minimize bycatch. Section 4.1.12.2 "Measures to minimize bycatch" specifically lists the deep-sea coral alternatives as measures that the Council is considering that will minimize bycatch. *See* DEIS at 62 (Alternative 4.1.12.2 -"Measures to minimize bycatch of deepwater corals"). Therefore, the Council has satisfied notice requirements to implement proposed deep-sea coral alternatives either as EFH measures, measures to minimize bycatch, or both.

[5] There is no suggestion that this closure will conflict with any of the National Standards – in fact it is clear that efforts to protect sensitive and diverse marine resources are well within the policy and goals of the MSA to protect fisheries and marine environment for the benefit of Nation.

Other federal laws and regulations supplement the Council's and Fisheries Service's broad authority to use its discretionary authority under the Magnuson-Stevens Act to protect deep-sea corals and modify proposed actions to minimize and mitigate environmental impacts of fishing on the marine environment.

Executive Order 13089 requires agencies to (a) identify actions that may affect U.S. coral reef ecosystems, (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems, and (c) ensure that any actions they authorize, fund or carry out will not degrade the condition of coral reef ecosystems. NOAA has publicly taken the position that Executive Order 13089 applies to deep-sea corals and, therefore, can be used by the New England Council as supplemental authority to protect deep-sea corals. NOAA Deep-sea Coral Briefing Document, Attachment II at 17. Therefore, the NEFMC can take action under its Discretionary Provisions, 16 U.S.C. 1853(b)(2), to act in furtherance of the goals and purposes of Executive Order 13089 and designate coral protection zones at this time.

Similarly, the Council can use its discretionary authority under 16 U.S.C. 1853(b)(2) to further the goals and policies of the National Environmental Policy Act, or NEPA. NEPA establishes a national policy for federal agencies to "prevent or eliminate damage to the environment and biosphere." NEPA §. 2, 42 U.S.C. Sec. 4321. The Act recognizes "the critical importance of restoring and maintaining environmental quality," and finds that *the federal government has a continuing responsibility to use "all practical means" to minimize environmental degradation and directs that "to the fullest extent possible . . . the policies, regulations and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act.*" NEPA Sec. 101(a), 102(1), 42 U.S.C. Sec. 4331(a), 4332(1) (emphasis added).

Damaging and destroying deep-sea corals is an identified potential significant and negative environmental impact of the proposed action: to re-initiate the directed monkfish offshore trawl fishery in areas known to contain deep-sea corals. DEIS at 52. The proposed alternatives to designate deep-sea coral protection areas would mitigate the environmental impacts of this proposed action with regard to certain known areas of deep-sea corals. Protecting deep-sea coral habitats is one action that is practicable and accomplishes the broad goals and policies of NEPA, while still consistent with the broad authority delegated to the NEFMC and NMFS to regulate fishing in federal waters. Statutory interpretations to the otherwise are unsupported, overly narrow and contrary to the clearly expressed intent of Congress.

5. Alternatives to Minimize Fishing Impacts to EFH

Oceana supports the protection of hard-bottom, gravel habitats and other habitats that provide important physical and biological structural complexity from bottom-tending mobile fishing gears. There is a clear consensus among marine habitat scientists, both in New England and nationwide, that gravel habitats: (1) provide valuable structural complexity that is essential to juvenile Atlantic cod and other New England groundfish;

(2) are a rare habitat type, that if lost, can lead to recruitment bottlenecks for species like Atlantic cod; (3) are the most susceptible to long-term damage by bottom-tending mobile gears. At a time when NEFSC scientists are reporting year-after-year of record-low survival of juvenile Georges Bank cod, it is essential to take action to protect known gravel habitats within designated juvenile cod EFH and protect them from bottom-tending mobile gears.

Monkfish Amendment 2 fails to contain specific alternatives to adequately protect gravel habitats found within juvenile cod EFH on Georges Bank and in the Great South Channel. Instead, Monkfish Amendment 2 proposes to rely on the various EFH alternatives recently implemented under the Groundfish Amendment 13 and Scallop Amendment 10. Oceana believes that EFH alternatives in place under the Groundfish and Scallop plans are inadequate and should not be relied on, because: (1) they are not based on the best scientific information; (2) they have been criticized by the New England Council's own habitat scientists; (3) they fail to adequately protect rare and sensitive gravel habitats on Georges Bank and in areas west of the Great South Channel; and (4) they are mainly comprised of less-sensitive and widely-abundant sand habitats. Rather than restate the extensive comments Oceana submitted on Groundfish Amendment 13 and Scallop Amendment 10 in these comments, Oceana incorporates by reference our past written comments on the Groundfish and Scallop plan amendments and their environmental impact statements.

6. Bycatch Measures

Section 4.1.12 of Monkfish Amendment 2 does not comply with the bycatch provisions of the Magnuson-Stevens Act, because it fails to: (1) establish a standardized reporting methodology for bycatch that accurately and precisely reports the amount and type of bycatch occurring in this fishery; and (2) fails to include measures to avoid bycatch or minimize the mortality of bycatch which cannot be avoided.

Assessment and Reporting Methodology

Accurate and reliable bycatch data is a fundamental management requirement in this and any fishery if it is to be managed in a sustainable manner both with regard to the monkfish resource, and the fishery's interactions with other managed commercial species, marine mammals, protected species, and threatened and endangered species.

In its prior oral and written comments to the New England Council, Oceana has urged increased observer coverage in this fishery. As we noted in our previous comments, the Monkfish FMP fails to establish a standardized bycatch reporting methodology, or to minimize bycatch and bycatch mortality as required by the SFA and recent case law.[6]

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[6] *See Conservation Law Foundation v. Evans,* 2001 WL 1873236, *20-*21 (D.D.C. Dec. 28, 2001); *Pacific Marine Conservation Council v. Evans,* No. C-01-2506, 7-9 (N.D. Cal. Apr. 12, 2002).

The paucity of information about bycatch in the monkfish fishery is clearly recognized by the New England Council, as well documented in Monkfish Amendment 2. DEIS at 60 ("The Councils do not propose any new bycatch monitoring programs, despite recognizing the need for improved bycatch monitoring."; *see also* DEIS at 208 (identifying Vessel Trip Reports as unreliable and existing observer coverage as inadequate to provide reliable estimates of discards in the fishery). Past Framework Adjustments, like Framework Adjustment 2, also frankly admitted that "[r]eliable quantitative estimates of the magnitude and scope of bycatch in monkfish fisheries, either of monkfish or other species, are not available." For these reasons, Oceana opposes the plans failure to consider any alternatives to improve bycatch reporting in the monkfish fishery, including alternatives to require increased levels of mandatory observer coverage.

Oceana also challenges the New England Council's stated justification to not consider options to require improved bycatch reporting and increased observer coverage. The supporting rationale for this position in Monkfish Amendment 2 is, "[s]ince the [national bycatch strategy]is currently being developed and evaluated on a national level, it would be impractical and counter-productive to implement such a program on a fishery-by-fishery basis at this time." (DEIS at 61). This rationale is arbitrary and capricious because the Northeast Regional Implementation Plan ("NERIP") admits that increases in observer coverage are necessary for many fisheries (NERIP, pg. 3), but fails to:

- Provide information as to the observer needs of the specific fisheries, including the monkfish fishery;
- Prioritize New England fisheries for future increases in observer coverage;
- Examine fish bycatch issues in sufficient detail to be used in settling regional priorities. (pg.3); or
- Commit to taking any action to improve reporting and reduction of bycatch in the monkfish fishery by a date certain in the future.

In short, the National Bycatch Strategy cannot be relied upon because the New England Regional Implementation Plan neither: (1) includes any proposed measures specific to improving bycatch reporting or reducing bycatch the monkfish fishery; nor (2) proposes to take any action by a date certain in the future to improve bycatch reporting and reduce bycatch in the Monkfish Fishery. Such an approach conflicts with legal mandates under the Magnuson-Stevens Act to include in each FMP: (1) a standardized bycatch reporting methodology that accurately assess the amount and type of bycatch occurring in the fishery; and (2) conservation and management measures that minimize bycatch and bycatch mortality to the extent practicable. 16 U.S.C. §1853(a)(11) and §1851(a)(9).

Increased observer coverage is especially needed as part of the new Offshore Fishery Program for the directed offshore monkfish trawl fishery. At the May 2003 New England Council meeting, NEFSC staff Dave Potter, testified that a high level of observer coverage is necessary in new and developing fisheries in order to create a sound baseline of information for effective future management and bycatch mitigation.

It is clear that in the past, this information baseline was never developed for any sector of the monkfish fishery, including the offshore trawl sector. Therefore, it is appropriate, and legally-required, to do so now, through the use of increased observer coverage in the Offshore Fishery Program.

Furthermore, increased observer coverage is necessary for the gillnet component of the monkfish fishery in the Northern and Southern Management Areas that interact with commercially-managed and depleted groundfish, marine mammals, and threatened or endangered sea turtles. Without increased observer coverage, it is impossible to ascertain the bycatch impacts of this fishery on the health and continued existence of managed and protected species. Oceana supports mandatory observer coverage levels of 20% for sectors that do not catch protected species, and 50% for those sectors that are known to interact with protected species. These levels of observer coverage are based on the best scientific information available, *see* Pikitch et al. (2003). *How Much Observer Coverage is Enough to Adequately Estimate Bycatch?* [Attachment IV], and therefore consistent with National Standard Two and legal mandates to establish a reliable and accurate bycatch reporting methodology in the Monkfish Fishery.

Electronic Vessel Monitoring Systems

Oceana supports measures to require electronic Vessel Monitoring Systems (VMS) in the Offshore Fishery Program, as this will provide valuable data about the location of fishing activity, facilitate enforcement of measures in the Monkfish Plan and other fishery management plans, and promote the safety of human life at sea, consistent with National Standard 10.

As evidenced in past controlled-access programs in the Atlantic Sea Scallop Fishery, VMS is a valuable tool for providing real-time information about fishing location, distribution, and catch. It is especially powerful when combined with adequate levels of observer coverage – resulting in a situation where accurate, site-specific catch and discard data can be used in real-time to achieve optimum yields avoid overfishing and excessive levels of discarding. For that reason, and the additional reasons outlined below, Oceana would urge the New England Council to also require increased levels of observer coverage in this fishery.

Measures to Avoid and Minimize Bycatch

Monkfish Amendment 2 is required under the bycatch provisions of the Magnuson-Stevens Act to include measures to avoid bycatch or minimize the mortality of bycatch which cannot be avoided. This includes bycatch of undersized monkfish, which continues to be a significant issue in the monkfish fishery, as the 34th SAW found that the majority of the monkfish population in both management regimes is less than the minimum landing size required under the FMP. 34th SAW at 193. Monkfish Amendment 2 also fails to adequately analyze total bycatch of non-target species occurring in the monkfish fishery. As the monkfish fishery mainly relies on non-selective bottom-trawls and gillnets, bycatch of non-target species is likely significant. Oceana is especially concerned about the capture of marine mammals and sea turtles in the gillnet fishery, and the capture of long-lived, slow-growing, deep-sea species that are caught, including deep-sea corals and sponges, as the monkfish trawl fishery extends its range further offshore in the deep-water slope areas off the New England and Mid-Atlantic continental shelf.

The list of measures included in the DEIS to reduce bycatch include measures to reduce bycatch of monkfish itself if but does very little to take any meaningful action to reduce the bycatch of other species that have been identified as bycatch in this fishery including marine mammals and threatened and endangered species such as sea turtles. Oceana has requested in its comments on prior Framework Adjustments that Monkfish Amendment 2 consider alternatives of the following bycatch-reducing measures:

- Reducing the amount of gillnets allowed per trip
- Requring gillnetters to monitor their nets and haul them daily (no overnight soaks)
- Prohibit long soaking times that unnecessary and wastefully kill fish, marine mammals, sea turtles, and other marine life
- Utilize time/area closures in areas of high rates of bycatch

These alternatives have not been considered, developed, or included in Monkfish Amendment 2. Oceana urges the Fisheries Service and the New England Council to modify Monkfish Amendment 2 and its Draft EIS to include these reasonable measures along with other available bycatch management measures such as bycatch caps to reduce bycatch and bycatch mortality in the monkfish fishery, and other fisheries that discard significant amounts of monkfish.

Thank you for considering these comments.

Sincerely,

Christopher J. Zeman
New England Fisheries Program Counsel
Oceana

RECEIVED
July 28, 2004
JUL 28 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

TO: Paul J. Howard, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

RE: Amendment 2 to the Monkfish Fisheries Management Plan

I am writing to share my serious concerns with and opposition to the de-coupling alternative in Amendment 2 to the Monkfish Fishery Management Plan (FMP). Although this concept was designed to provide the industry with flexibility, in reality, this alternative has the potential to increase effort in both the Monkfish and Multi-species Fisheries. Such effort would alter the rebuilding programs in these fisheries, thus, require additional reductions in DAS in both fisheries. This effort also has the potential to negatively affect the stability of the market. So, in addition to DAS reduction, fishermen would be receiving a lower price for their product.

As a Monkfish Advisor, I am hoping that these negative consequences are taken into consideration during the Monkfish FMP decision-making process.

In addition, I believe the B-Day Program in the Multispecies Fishery Management Plan would provide the needed flexibility that the fishing industry is in search for. Thus, I encourage the Monkfish Committee and Council to consider this program as the alternative to de-coupling.

Steph Welch

Steve Welch
FV American Heritage
Scituate, Massachusetts

Patricia Kurkul
Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: Monkfish Amendment 2 DSEIS

Dear Ms. Kurkul,

My family and I have no direct financial interest in the fishing industry. We do however have three children and whole-heartedly believe their future environment is being degraded. We took them on first whale watch out of Gloucester this year and, as one might expect, had to answer questions of what happened to many of the whales? What does "extinction" mean?

We ask you, please, to support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan, as well as choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

These seem entirely reasonable precautions, given how little we know what the impact of deep-water trawling will ultimately be. I have friends who work at Woods Hole Oceanographic Institute, and they all are against opening up this so far unspoiled region. Closing only some of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing, at least for now, just seems prudent. These canyons are important nursery areas for fish populations that are already over fished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks. In short, supporting the protecting of submarine canyons is making a sound business decision to protect the future of fishing in new England!

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Thanks for your time and attention.

Sincerely,

Peter & Eileen McSherry
9 Pine Street
Melrose, MA 02176
781-665-6829

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JUL 28 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

August 21, 2004

Nancy Sullivan
41 Bluegrass Ave.
Ft. Thomas, KY 41075

Patricia Kurkul,
Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Nancy Sullivan,

RECEIVED
JUL 26 2004

Rosalind McDermott
2602 Bonita Cir.
Huntsville, AL 35801

RECEIVED
JUL 28 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

/23/04

'atricia Kurkul, Northeast Regional Administrator
lational Marine Fisheries Service
)ne Blackburn Drive
iloucester, MA 01930-2298
'AX: (978) 281-9333

ubject: choose the strongest possible protections for southern New England's magnificent nderwater canyons

'ear Ms. Kurkul,

Having experienced the damage that bottom trawling did to a long time vacation scalloping site in Florida, I support the complete closure of submarine canyons to monkfish trawling (proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan). I urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." My only problem with this alternative is that it would close only "up to" 12 of the deep water canyons in areas below 200 meters. Closing these canyons would protect only designated essential fish habitat for multiple fish species, I believe we don't know enough what we might destroy, so all deep water canyons and everywhere else should be closed. As well as being among the eastern seaboard's most significant assemblages of deep water corals and other marine life, the canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

Please preserve our ocean environment for this generation and beyond.

ncerely,

Rosalind McDermott

)salind McDermott

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JUL 26 2004

Ms. Patricia Kurkul
Northeast Regional Administrator National Marine
Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

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JUL 28 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

July 22, 2004

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Patty Glover

Patty Glover
1338 Wyngate Dr.
Lakeland, Fl 33809

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JUL 26 2004

JUL 26 2004

142 Lawrence Road
Medford, Massachusetts 02155
July 23, 2004

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JUL 28 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, Massachusetts 01930-2298

Subject: Monkfish Amendment 2 DSEIS-Choose 5C-Option 2

Dear Ms. Kurkul,

I'm writing in support of the closure of submarine canyons to monkfish trawling as proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan. Please choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and grillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as the eastern seaboard's most significant assemblages of deepwater corals and other marine life. In addition, these canyons are important nursery areas for a number of fish populations that are overfished, including halibut, white hake, and witch flounder. The proposed closures would help to rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge you to please support Alternative 5AB-Option 2. This would close Oceanographer Canyon and Lydonia Canyon to trawl and grillnet monkfish fishing.

In short, please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment. Thank you for your consideration of this very important matter. I would appreciate a reply stating what you intend to do.

Sincerely,

Phyllis Wolff

Phyllis Wolff

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JUL 28 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Patricia Kurkul, Northeast Regional Administrator

National Marine Fisheries Service

One Blackburn Drive

Gloucester, MA 01930-2298

7-21-4

Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul:

We support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, we urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Erik Lundgren

Laura-Marie Taylor and Erik Lundgren

1728 Richmond St #9 Sacramento, CA 95825

RECEIVED
JUL 26 2004

750 Weaver Dairy Rd., #3115
Chapel Hill, NC 27514
Marnieclark@mindspring.com
July 22, 2004

Ms. Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Dr.
Gloucester, MA 01930-2298

Dear Ms. Kurkul:

Since monkfish trawling is so damaging to the deepwater corals and other marine life in the deepwater canyons off the coast of souther New England, I urge you to promote acceptance of the proposals of the New England Fishery Management Council and the Mid-Atlantic fishery Management Council to expand the protected area further offshore to encompass these sensitive areas.

Sincerely,

Marnie Clark

Marnie Clark
750 Weaver Dairy Rd., #3115
Chapel Hill, NC 27514

Susan Kennedy, Acting NEPA Coordinator
NOAA Strategic Planning Office
SSMC3, Room 15603
1315 East-West Highway
Silver Spring, MD 20910

RECEIVED
JUL 28 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Greetings:

I support the closure of the submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing.

Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Very truly yours,

Catherine E. Tucker

Catherine E. Tucker
2249 Cordoba Way
Antioch, CA 94509

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NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

July 21, 2004

Ms. Patricia Kurkul
Northeast Regional Administrator
National Marine Fisheries Service
1 Blackburn Dr.
Gloucester, MA 01930-2298

Re: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

You know that the New England Fishery Management Council and the Mid-Atlantic Fishery Management Council have proposed expanding a monkfish fishery from over-fished inshore areas into offshore areas that encompass fragile underwater canyons. One pass with a monkfish bottom trawler could destroy a canyon's unique and sensitive corals and other marine life.

I am writing to urge the National Marine Fisheries Service to choose the strongest possible protections for southern New England's magnificent underwater canyons. Therefore, I support the closure of submarine canyons to monkfish trawling as proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan, and I plead with you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." Closing the deepwater canyons to trawl and gillnet fishing would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. Furthermore, the canyons are also important nursery areas for a number of fish populations that are over fished, and the proposed closures would help rebuild depleted stocks.

Biologists, of course, would prefer that as many of these fragile canyons as possible remain protected.

If you do not choose Alternative 5C-Option 2, I hope that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and help preserve this ocean environment for its native inhabitants.

Sincerely,

Theodore S. Cochrane

Theodore S. Cochrane
449 Jean St.
Madison, WI 53703-1615
tscochra@wisc.edu

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NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

July 21, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least supportAlternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Tom Clements

Tom Clements
6703 Gude Ave.
Takoma Park, MD 20912

RECEIVED
JUL 23 2004

5FD

Veronica Zolina

☎ (781) 893-3868 12 Hazel Street #1, Waltham, MA 02451 12hazel@gis.net

July 21, 2004

Ms. Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: **Monkfish Amendment 2 DSEIS - Choose 5C-Option 2**

Dear Ms. Kurkul,

Monkfish fishing methods pose a serious hazard to the unique underwater canyon environment. I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. This would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant, unique and magnificent assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, whose populations need protection.

A less desirable choice is Alternative 5AB-Option 2, which would close only Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Cordially,

VZolina

122A Englewood Avenue
Brighton, Massachusetts 02135
July 23, 2004

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JUL 2 8 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, Massachusetts 01930-2298

Subject: Monkfish Amendment 2 DSEIS-Choose 5C-Option 2

Dear Ms. Kurkul,

I'm writing in support of the closure of submarine canyons to monkfish trawling as proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan. Please choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and grillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as the eastern seaboard's most significant assemblages of deepwater corals and other marine life. In addition, these canyons are important nursery areas for a number of fish populations that are overfished, including halibut, white hake, and witch flounder. The proposed closures would help to rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge you to please support Alternative 5AB-Option 2. This would close Oceanographer Canyon and Lydonia Canyon to trawl and grillnet monkfish fishing.

In short, please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment. Thank you for your consideration of this very important matter. I would appreciate a reply stating what you intend to do.

Sincerely,

Sarah Wolff

Sarah Wolff

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JUL 28 2004

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JUL 2 8 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Linn Barrett
4305 29th Street Road
Greeley, CO 80634

Patricia Kurkul
Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

July 22, 2004

Re: Monkfish Fishery Management Plan

Dear Ms. Kurkul,

I support the closure of the submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing.

Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are over-fished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further over-fishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

With utmost conviction and sincerity,

Linn

Linn D. Barrett

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JUL 2 8 2004

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Written Comments

791 Generic Emails Received by NEFMC
July 16 – July 28, 2004

comments

From: ktips@msn.com
Sent: Tuesday, July 27, 2004 12:55 PM
To: comments@nefmc.org
Subject: Please support NEFMC Preferred Alternative 5AB, option 1

Dave Borden

Dear Dave Borden,

I support the creation of no-trawl zones in marine areas that contain fragile, and slow-growing deep-sea corals. I support the New England Council's Preferred Alternative (5AB, option 1) in Monkfish Amendment 2 to protect fragile deep-sea corals in two deep-sea canyons on Georges Bank - Oceanographer and Lydonia canyons - from bottom-trawling by fishermen catching monkfish. This is a proactive first step to protect New England deep-sea corals from the expanding offshore monkfish trawl fishery.

Thank you for considering these comments.

Sincerely,

K Trombly
79 Athelstane Road
Newton, Massachusetts 02459

cc:
Governor Mitt Romney
Dr. William Hogarth

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Written Comments

17 Generic Letters Received by NEFMC
July 16 – July 28, 2004

RECEIVED
JUL 28 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Public Comment
On Amendment 2

I disagree with the "preferred" alternatives to Decision 1, DAS Alternative 1, and DAS Alternative 1b, to decouple Monkfish DAS from Scallop or Multispecies DAS usage.

These alternatives could have many negative impacts on the fishery for monkfish, as well as multispecies, for the following reasons. The "freed up" DAS would allow multispecies vessels to pursue ground fish <u>and</u> monkfish on their multispecies DAS with no trip limit on monkfish in the northern area. This is the current regulation.

The same vessel would then be allowed to pursue monkfish again while using monk only DAS, the combined pressure on monkfish will be enormous.

The directed scallop vessels with monk permits will also be catching monk while on a Scallop DAS, then can shift effort on monkfish directly with their separate Monkfish DAS.

These Monkfish DAS if unused can be leased to other vessels that are currently directing on monk, creating even more pressure.

These proposed measures "while being attractive to those who stand to gain" will no doubt create more effort on monkfish, this will in time, take away DAS from those fisherman who fish exclusively in the Southern area. The current regulation allows a 450-550 lb. trip limit and 28 DAS in the southern area. This reduction is reflective of the current fishing effort on monkfish.

The combination of increased fishing effort and probable DAS reductions makes these alternatives inequitable and unacceptable.

Charles & Nancy Inc.
Box 313
Barnegat Light, NJ 08006

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Written Comments

4,863 Generic Emails Received by NOAA/NMFS

Subject:
Monkfish Amendment 2 DSEIS - Choose 5C-Option 2
From:
"Shannon Webb" <shannon@ben-e-fit.com>
Date:
Tue, 3 Aug 2004 17:32:07 -0400
To:
"MonkfishDSEIS@noaa.gov" <MonkfishDSEIS@noaa.gov>

August 03, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Dear Ms. Kurkul,

I support the closure of the submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing.

Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Shannon Webb
P.O. Box 131
Pescadero, CA 94060-0131
USA
shannon@ben-e-fit.com

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Written Comments

Comments received by NOAA/NMFS

NRDC
THE EARTH'S BEST DEFENSE

Natural Resources Defense Council
40 West 20th Street
New York, NY 10011
Tel: (212) 727-2700
Fax: (212) 727-1773

July 28, 2004

Via electronic mail

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298
Email: MonkfishDSEIS@noaa.gov

Re: Monkfish Amendment 2 DSEIS

Dear Ms. Kurkul:

We respectfully submit these comments on behalf of the Natural Resources Defense Council ("NRDC"), an environmental organization that represents more than 550,000 members around the country, on Amendment 2 to the Monkfish Fishery Management Plan and its accompanying Draft Supplemental Environmental Impact Statement ("DSEIS").

NRDC supports what the DSEIS designates as Essential Fish Habitat ("EFH") Alternative 5C ("Alternative 5C"), which proposes to close up to 12 deepwater canyons in areas below 200m. The DSEIS states that Alternative 5C will protect EFH because the hard substrate and steep walls of the canyons serve as critical habitat for significant numbers of deepwater corals, including some of the largest known assemblages of such corals on the Atlantic coast. Closure of the canyons would protect these deepwater corals colonies from the destructive impacts of bottom trawling for monkfish.

NRDC strongly supports Alternative 5C for the purpose of protecting deepwater corals. In addition, as discussed in further detail below, NRDC strongly supports Alternative 5C because it will help prevent the overfishing of monkfish and other depleted species, ensure the timely rebuilding of several depleted stocks, protect designated essential fish habitat for several stocks, and minimize bycatch and bycatch mortality of corals, sponges, and depleted fish stocks such as white hake, redfish, and witch flounder. The DSEIS fails to adequately discuss these additional significant benefits of, and legal bases for, Alternative 5C. Accordingly, the DSEIS should be revised prior to finalization to incorporate the necessary discussion.

would minimize the bycatch of corals and other fish species by restricting the introduction of new fishing gear in the canyons, thereby reducing the interaction between fishing gear and the sensitive canyon environment, including the deepwater corals. Based on current exploitation information summarized supra in the discussion of the practicability of protection of EFH from adverse gear impacts, Alternative 5C is practicable for purposes of minimizing bycatch and bycatch mortality.

4. NRDC also supports EFH Alternative 5AB. Although Alternative 5C offers significantly greater benefits, NRDC also supports EFH Alternative 5AB, which would close Oceanographer and Lydonia canyons to monkfish fishing. Both canyons contain extensive numbers of hard and soft corals. Indeed, Oceanographer canyon is believed to contain between 20 to 50 percent of all deepwater corals on Georges Bank. Both Oceanographer and Lydonia are believed to serve as a larval source for other areas on the continental shelf. The location of Oceanographer and Lydonia canyons relatively close to major ports makes them prime candidates for exploitation and, therefore, prime candidates for closure.

* * * *

NRDC appreciates the opportunity to comment on the DSEIS.

Very truly yours,

Bradford H. Sewell
Senior Attorney

cc: Susan Kennedy, Acting NEPA Coordinator
NOAA Strategic Planning Office (PPI/SP)
SSMC3, Room 15603
1315 East-West Highway
Silver Spring, Maryland 20910
Email: nepa.comments@noaa.gov

Discussion

1. Alternative 5C will help satisfy legal requirements to end overfishing and rebuild stocks as quickly as possible. In the early 1990s, high monkfish mortality coupled with low stock biomass triggered the development of the Monkfish Fishery Management Plan. Both the northern and the southern monkfish stocks were overfished and subject to overfishing. In 1999, NMFS finalized the Monkfish Fishery Management Plan, the stated purposes of which included stopping overfishing and rebuilding the monkfish stock. See 64 Fed. Reg. 54732. The FMP divided the stock into two management areas, the Northern Fishery Management Area ("NFMA") and the Southern Fishery Management Area ("SFMA"). The FMP was designed to halt overfishing in 2002 and allow rebuilding of the stock in both the NFMA and SFMA to the stock biomass targets by 2009.

By fishing year 2003, overfishing of monkfish had ended in the NFMA but not in the SMFA. Absent additional conservation measures, overfishing is likely to continue to occur in the SFMA. Moreover, absent additional conservation measures, monkfish are unlikely to be rebuilt by 2009, as required.

The best available science indicates that the remote canyon areas encompassed by Alternative 5C currently serve as refuges for significant concentrations of monkfish. According to the NMFS monkfish survey, monkfish are concentrated on the edge of the continental shelf where the canyons are located. (E.g., DSEIS – pg 75) The 2001 cooperative monkfish survey covered deeper waters than the NMFS monkfish survey and confirmed a concentration of monkfish along the continental shelf and in the canyon areas. (E.g., DSEIS – pg 76).

The need for the conservation benefits of Alternative 5C will be even greater if certain management actions described in the DSEIS are adopted. For example, the proposed offshore SFMA monkfish fishery would establish a separate set of regulations for vessels fishing in the offshore waters of the SFMA. This offshore monkfish fishery would effectively incorporate a "running clock" into the FMP and would increase the pressure on the southern stock. Depending on the specific area chosen, the offshore SFMA fishery would overlap with at least seven canyons, including Oceanographer, Hydrographer, Vetach, Atlantis, Hudson, Wilmington, Baltimore, and could encompass as many as ten canyons including (in addition to the just named canyons) Heezen, Lydonia, and Gilbert.

In future years, in part because of such management actions like the proposed creation of the offshore SFMA fishery, it is likely that the monkfish fleet will expand fishing intensity further offshore, including into the canyons. The larger, commercial net used in the cooperative survey and designed for efficiently catching monkfish is just one signal of the feasibility of a directed monkfish fishery along the continental shelf and in the canyons. Accordingly, adoption of Alternative 5C would (1) provide necessary additional conservation benefits to the existing set of management measures, and (2) balance the increased exploitation that would result from implementation of such management initiatives as the offshore SFMA fishery, as well as the more generalized expansion of the monkfish fishery into offshore areas, including the canyons.

Alternative 5C would also provide substantial benefits to certain other overfished stocks that are in need of additional conservation measures. Specifically, portions of the canyons are designated EFH for white hake and redfish. White hake juveniles and adults have EFH designated to 325 meters into the submerged canyons. Similarly, redfish juveniles and adult have EFH that extends 350 meters into Heezen, Lydonia, Gilbert, Oceanographer, and Hydrographer canyons. Because of the adverse habitat impacts of bottom trawling, as discussed infra, protecting the canyons from expanded bottom trawling in a directed monkfish fishery will benefit these stocks' rebuilding and reduce overfishing.

Indeed, for both redfish and white hake, NMFS is under a legal obligation to further reduce fishing mortality. Alternative 5C would help NFMS meet this legal obligation. Specifically, the recently-implemented Amendment 13 to the New England Multispecies Fishery Management Plan ("Amendment 13") improperly allows overfishing to continue on white hake for five years (until 2009). Moreover, federal law requires that both white hake and redfish stocks be rebuilt in as short of time period as possible, not to exceed ten years. Under Amendment 13, redfish is not proposed to be rebuilt until 2051. Because Amendment 13 fails to ensure the timely end to overfishing and the rebuilding of these stocks, other FMPs such as the Monkfish FMP must supplement the conservation measures by taking steps to protect them from incidental catch and to protect their habitat.

2. Alternative 5C will protect EFH from adverse fishing gear impacts and is practicable. Many managed fish stocks have EFH that overlaps with the canyon areas proposed for closure under Alternative 5C. The canyons specifically serve as foraging and breeding habitat for a number of heavily exploited species common to the outer shelf and upper slope. Moreover, the canyons encompass significant habitat for a variety of fish populations that are caught incidentally in, or otherwise harmed by, commercial fishing, including specifically by use of bottom trawl gear.

For example:

a. White Hake: Juvenile and adult white hake have designated EFH in bottom habitats with a substrate of mud or fine-grained sand up to 325 meters. According to DSEIS, the juvenile white hake EFH has a moderate vulnerability to trawl gear. The white hake juvenile and adult EFH habitats overlap with the following canyons: Heezen, Lydonia, Gilbert, Oceanographer, Hydrographer, Vetach, Atlantis and Hudson.

b. Redfish: Juvenile and adult redfish have designated EFH in bottom habitats with a substrate of silt, mud or hard bottom to 350 meters (adults) and 400 meters (juveniles). The juvenile EFH is considered to have a high vulnerability to trawl gear and the adult EFH to have a moderate vulnerability to trawl gear. Habitat vulnerability from otter trawls in boulder habitats is considered high because gear can overturn boulders and reduce the number of crevices as well as dislodge cerianthid anemones from the bottom. The redfish juvenile and adult EFH habitats overlap with the following canyons: Heezen, Lydonia, Gilbert, Oceanographer, and Hydrographer.

c. Barndoor Skate: Juvenile and adult barndoor skate have designated EFH in mudbottom and sand and gravel to 750 meters. Juvenile and adult barndoor skate EFH is considered to have a moderate vulnerability to trawl gear. Juvenile EFH is considered to be moderately vulnerable to otter trawls and scallop dredges because of the closer association of juveniles to a benthic invertebrate diet. Adult EFH vulnerability to otter trawls and scallop dredges is considered to be moderate due primarily to the skate's reproductive habits. The barndoor skate juvenile and adult EFH habitats overlap with the following canyons: Gilbert, Oceanographer, Hydrographer and Atlantis.

d. Witch Flounder: Juvenile and adult witch flounder have designated EFH in bottom habitats with fine grained substrate and along the outer continental shelf to 300 meters (adults) and 450 meters (juveniles). Juvenile and adult witch flounder EFH have moderate vulnerability to trawl gear. The witch flounder juvenile and adult EFH habitats overlap with the following canyons: Heezen, Lydonia, Gilbert, Oceanographer, Hydrographer, Vetach, Atlantis, Hudson, Wilmington, Washington, and Norfolk.

e. Red Deep-sea Crab: Juvenile red deep-sea crab has designated EFH in smooth-surface silt-clay between 700 and 1800 meters. Adult red deep-sea crab has designated EFH in silty and hard sediments between 200 and 1300 meters.

Monkfish trawling would have a negative impact on the bottom habitat that forms EFH for these and other species and makes these canyons so unique. As documented by the National Academy of Sciences and otherwise supported by the best available science, trawling reduces habitat complexity. The direct adverse effects of trawling include loss of erect and sessile epifauna, smoothing of sedimentary bedforms and reduction of bottom roughness, and removal of taxa that produce structure. Trawl gear can crush, bury, or expose marine flora and fauna and reduce structural diversity.

The best available science also indicates that fauna that live in low natural disturbance regimes like the deepwater canyons are more vulnerable to fishing gear disturbance. Habitats consisting of unconsolidated sediments that experience high rates of natural disturbance can have more subtle responses to trawling than habitats characterized by boulders or pebbles. Epifaunal communities that stabilize sediments, reef-forming species, or fauna in habitats that experience low rates of natural disturbance have been observed to be particularly vulnerable. Likewise, softbodied, erect, sessile organisms are more vulnerable to mobile gear than are hard-bodied prostrate organisms.

The best available science also shows that trawling reduces habitat complexity as a result of the removal of sessile epifauna and the alteration of physical structure, such as rocks and cobble. Emergent epifauna, such as sponges, hydroids, and bryozoans, provide habitat for invertebrates and fishes. Disturbance of emergent epifauna is believed to increase the predation risk for juvenile fish. Decreased prey abundance increases the foraging time for juvenile fish, thus exposing them to higher predation risk.

The Magnuson Stevens Act, section 303 (a)(7), requires that adverse impacts from fishing activities on EFH be minimized to the extent practicable. As shown by the DSEIS, Alternative 5C is practicable. A total of only 9 trawl trips would be affected, based on 1999 data; less than 3 trips would be affected, based on 2001 data. An additional 21 gillnet trips would be affected, based on 2001 data.

3. Alternative 5C would reduce bycatch, including bycatch of deepwater corals, and is practicable. Monkfish trawling along the canyon slopes and in areas of hard substrate would inevitably result in the bycatch of canyon fish species, including deepwater corals. Many species of deepwater corals are considered particularly vulnerable to harm from fishing activities, including direct physical harm and indirect harm resulting from changes in the water column and alteration of adjacent environment. Bottom trawling specifically is able to devastate extensive patches of corals. Generally, these sessile animals are most concentrated in the middle depth range, and can be found on the walls, flanks, and axis of the canyons.

Unfortunately, recovery of canyon megafaunal communities from disturbances is predicted to be considerably slower than that of slope assemblages. Based on aging data, deepwater corals in particular can be hundreds to thousands of years old, and are extremely slow to recover from harm. The vulnerability of these fish populations is further enhanced by the fact that many of these species are rare and restricted to relatively uncommon areas of exposed hard substrate. Loss of and harm to canyon populations of these organisms would represent a significant, long-term adverse impact. Since most of these species are sessile, and thus depend on "larval recruitment" to recolonize perturbed areas, loss of local canyon populations might represent loss of "stock" populations for recolonizations. For example, the larger coral and anemone populations of Oceanographer Canyon are considered to be valuable communities both as refuges and as suppliers of larvae to more disturbed areas in the region.

National Standard 9 requires that "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." Alternative 5C

Patricia Kurkul
Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: Monkfish Amendment 2 DSEIS

Dear Ms. Kurkul,

My family and I have no direct financial interest in the fishing industry. We do however have three children and whole-heartedly believe their future environment is being degraded. We took them on first whale watch out of Gloucester this year and, as one might expect, had to answer questions of what happened to many of the whales? What does "extinction" mean?

We ask you, please, to support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan, as well as choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

These seem entirely reasonable precautions, given how little we know what the impact of deep-water trawling will ultimately be. I have friends who work at Woods Hole Oceanographic Institute, and they all are against opening up this so far unspoiled region. Closing only some of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing, at least for now, just seems prudent. These canyons are important nursery areas for fish populations that are already over fished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks. In short, supporting the protecting of submarine canyons is making a sound business decision to protect the future of fishing in new England!

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Thanks for your time and attention.

Sincerely,

Peter & Eileen McSherry
9 Pine Street
Melrose, MA 02176
781-665-6829

July 26, 2004

Ms. Patricia Kurkul
Regional Administrator - Northeast Region
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Dear Pat:

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Statement (DSEIS) on Amendment 2 to the Monkfish Fishery Management Plan (Monkfish FMP). The Ocean Conservancy has been actively involved in fisheries management issues in the Northeast for well over a decade and we have consistently advocated for the Council and NMFS to implement the measures needed to meet the Magnuson-Stevens Act requirements to end overfishing and rebuild depleted fish populations, to minimize wasteful bycatch, and to minimize adverse effects to fish habitat caused by fishing gear. Given our long-standing commitment to fish conservation in the region, we urge you to carefully consider our comments and incorporate them into the final Amendment 2 document.

The Ocean Conservancy supports many of the goals and objectives outlined in the Monkfish FMP, including 1) preventing overfishing and rebuilding overfished stocks as necessary, 2) addressing implementation problems associated with the FMP, 3) promoting improved data collection and research, 4) addressing deficiencies in meeting Magnuson Act requirements, and 5) addressing protected resource/fishery interactions – especially sea turtle/gillnet interactions.

The Ocean Conservancy also supports the efforts by the Councils and NMFS to establish more direct control over the monkfish fishery, rather than relying on measures in other management plans – including the scallop and groundfish FMPs - to meet monkfish management objectives. The DSEIS recognizes that "having a fishery that is directly controlled by regulations specific to the monkfish fishery will also allow managers to exercise more control over monkfish effort in achieving optimum yield, since that effort will no longer be indirectly, and sometimes unintentionally controlled by the regulations implemented to manage effort in multispecies or scallop fisheries". (see DSEIS p. 22). We offer the following comments to help assure that Amendment 2 to the Monkfish FMP achieves these goals and complies with the critically important overfishing, bycatch, and habitat provisions of the Magnuson-Stevens (MSA) and Sustainable Fisheries (SFA) Acts.

1. Overfishing and Rebuilding

The Ocean Conservancy supports a fundamental goal of the Monkfish FMP, which is to prevent overfishing of both the northern and southern monkfish stocks and to rebuild those populations as necessary. As you know, preventing overfishing is an overarching principle in the 1996 amendments to the MSA and National Standard 1 requires that "[c]onservation and management shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery." 16 U.S.C. § 1851(a)(1).

Given these requirements, we are concerned that the Councils are considering a number of measures to increase effort in the monkfish fishery considering the history of overfishing in this fishery and the scientific uncertainty regarding current fishing mortality rates. Consider the following facts. Monkfish populations were formally evaluated during two stock assessment workshops completed in the past five years. In 2000, Stock Assessment Workshop 31 (SAW 31) concluded that both stocks were overfished and subject to overfishing in 1999. SAW 34, reached the same conclusion in 2001 and also "advised that fishing mortality rates need to be reduced 20-40% to reach the proposed fishing mortality rate threshold and that discards should be reduced". (see DSEIS p. 8). In spite of ongoing efforts to improve our understanding of monkfish populations, the scientific consensus continues to be that the status of the stocks with respect to fishing mortality is unknown since there are no estimates of current fishing mortality. (see DSEIS p. 77).

In light of these facts, we urge the Council and NMFS adopt a precautionary approach to monkfish management. The need for a precautionary approach is especially critical since dependency on this fishery has increased due to the poor conditions in other fisheries. (see DSEIS p. 333). Given the existing situation, we are deeply concerned that the Monkfish FMP includes a number of measures to increase overall fishing effort, especially in the southern fishery management area where stock status appears to be the weakest. The DSEIS recognizes that many of these measures (including de-coupling DAS, DAS leasing, new permit qualification criteria, and actively promoting an offshore fishery in the southern area) will likely increase effort in the monkfish fishery, as well as the scallop and groundfish fishery. Consider the following statements from the DSEIS:

- "separating DAS usage requirements for Category C and D permits could result in increased directed fishing effort as a result of monkfish DAS being "freed up"...At the same time, multispecies Category C and D vessels, and to a lesser extent, scallop C and D vessels, could direct more of their effort on multispecies or scallops stocks, since they would have monkfish only DAS to target monkfish" (see DSEIS p. 238).
- "the decoupling of monkfish DAS from scallop or multispecies DAS usage requirements could result in some multispecies DAS being directed on groundfish where they otherwise would have been used on DAS targeting monkfish" (see DSEIS p. 241).
- "in the SFMA...Category C and D could increase overall effort compared to no action because they would have monkfish DAS in addition to their multispecies or scallop DAS, not in combination with their other DAS" (see DSEIS p. 246).

- "in the offshore SFMA fishery, the increased trip limits associated with the programs provide vessels with an incentive to shift effort into the areas defined". (see DSEIS p. 249)

We urge the Council and NMFS to take every step necessary to assure these measures and others do not increase overall mortality and undermine rebuilding efforts. Under the proposed plan, the Councils will continue to rely on the annual TAC adjustment process to make up for any overages caused by an effort increase in the monkfish fishery. (see DSEIS p. 239). We question the efficacy of this process to prevent overfishing on annual basis and urge the Councils to consider additional accountability measures and backstop mechanisms (i.e., annual and/or seasonal hard TACs and overage deductions) to assure that overfishing is prevented and rebuilding continues.

2. Bycatch and Observers

The Ocean Conservancy is deeply concerned that Amendment 2 fails to include adequate measures to minimize bycatch (particularly of endangered marine mammals and sea turtles) and fails to require a standardize bycatch reporting methodology as required by law. As you know, National Standard 9 requires that "conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." 16 U.S.C. § 1851(a)(9). Fishery management plans must also "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, an include conservation and management measures that . . ." minimize bycatch to the extent practicable. 16 U.S.C. § 1853(a)(11).

Despite these requirements, information presented in the DSEIS clearly demonstrates that bycatch and discards in the monkfish fishery (of both monkfish and sea turtles) continues to be a significant problem.

Monkfish Bycatch

Data presented in Table 67 shows that monkfish bycatch rates in dredge and trawl gear range from 35-43% in northern area and 27-29% in southern area. (see DSEIS p. 209). The Council has proposed measures proposed to address the problem, including changes and/or elimination of minimum fish size requirements, changes in mesh size and trawl configurations, and adoption incidental catch limits for bycatch fisheries.

We oppose the proposal to eliminate minimum fish size requirements as a way to reduce bycatch and discards. As the DSEIS recognizes "minimum fish size regulations have been widely used in FMPs on the basis that they discourage the targeting of small fish and increase yield per recruit". (see DSEIS p. 39). We agree with this conclusion and urge Council to maintain minimum fish size regulations and to match mesh size requirements and selectivity characteristics in the fishery. We understand PDT has recommended against minimum fish sizes for the fishery, citing that a significant portion of monkfish is caught as bycatch in fisheries that are not as selective as the directed fishery. However, we disagree with the PDT conclusion that "as long as small mesh and even 6-inch mesh fisheries catch monkfish, then a minimum size regulation will cause avoidable discarding of sub-legal sized monkfish." (see DSEIS p. 39).

Developing more selective fishing gear and practices is the solution to this problem, eliminating an important fisheries management tool like minimum fish sizes is not. We also see merit in the proposal to adopt uniform minimum fish size requirements in northern and southern area as long as the biology of the two stocks supports the change. Finally, we support the proposal in section 4.1.2 to adopt incidental catch limits for fisheries with significant monkfish bycatch. However, urge Council to adopt overall bycatch caps (Hard TACs) for these fisheries as well as daily trip limits, because doing so will provide real economic incentives to avoid the wasteful bycatch and discarding currently occurring in the fishery.

Sea Turtle and Marine Mammal Bycatch

Information presented in the DSEIS demonstrates that bycatch of marine mammals and sea turtles in the monkfish fishery is a significant concern. Consider the following findings:

- "It is known, however, that right, fin, humpback, and sei whales and loggerhead, green, Kemp's ridley, and leatherback sea turtles become entangles in both trawl and sink gillnet gear that is identical or similar to that used in the monkfish fishery" (see DSEIS p. 245)
- "sea turtles occur through all or most of the area in which monkfish gillnet gear is set" (see DSEIS p. 244);
- "of particular concern is the early spring monkfish gillnet fishery that occurs off North Carolina and Virginia in March through May...Although monkfish fishing effort in EEZ waters off North Carolina and Virginia is far less than elsewhere in the action area, the high concentrations of turtles in the area means there is a risk of a high level of interaction with the fishery" (see DSEIS p. 244);
- "the use of tie-downs for gillnets set in the same areas may increase the likelihood that turtles will be caught in the net" (see DSEIS p. 245);
- "the long soak time of monkfish gillnets, particularly in the Mid-Atlantic, also increase the risk of seat turtle entanglements by increasing the length of time that the net is in the water...Soak times for monkfish gillnets, in general, are greater than the submergence tolerance of sea turtles. Therefore, sea turtles are almost certainly expected to die as a result of capture in a monkfish gillnet unless the animal is caught in the net close to the surface and has the ability to breathe, or is caught immediately prior to hauling of the net" (see DSEIS p. 245);
- Under alternative 1 (decoupling of DAS), the potential for interactions with protected species in the SFMA is likely to increase: (see. P. 247). Lastly,

Given these findings and the endangered status of sea turtles in the Atlantic, we are deeply concerned that the Councils have failed to propose any specific measures to minimize sea turtle takes. Instead, the Council proposes to simply include a list of actions that can be taken to protect sea turtles and other marine mammals in some undetermined future framework adjustment process as the need arises. In fact, the DSEIS goes so far as to claim that creating a list of frameworkable items "is expected to have positive benefits for the protected species that are likely to interact with monkfish gear in the EEZ" (see DSEIS p. 250). We disagree with the conclusion that this administrative measure will have any positive benefits to protected species in the short-term and urge the Councils to take concrete steps now to address this critical problem.

The DSEIS reveals that the Council originally considered including specific measures to address the immediate problem of sea turtle catches in the large mesh gillnet fishery south of 38 N in this amendment, but chose not to do so. (See DSEIS p. 77). We urge the Council to reconsider this decision and to implement proactive measures to significantly reduce incidental takes of sea turtles and marine mammals as required by law.

Observer Coverage and Bycatch Reporting Methodologies

The Ocean Conservancy also urges the Council and NMFS to increase observer coverage to levels sufficient to assure both accurate and precise estimates of bycatch in the monkfish fishery. Under the current systems, managers rely almost exclusively on observer coverage in the scallop and groundfish fisheries for bycatch information in the monkfish fishery. This approach has led to inadequate information on bycatch and unreliable estimates of incidental takes of protected species in the fishery. Consider that the April 2003 Biological Opinion prepared for the monkfish fishery notes that there have been no reported or observed incidental takes of sea turtles specifically in the monkfish otter trawl fishery during any time of the year. (see DSEIS p. 245). This finding alone would suggest to fishery managers that there are no incidental takes of sea turtles in the monkfish fishery. Yet the DSEIS admits that this is not the case and that inadequate levels of observer coverage continue to be a concern. Consider the following:

- "Although bottom trawls have documented takes of sea turtles, there are none documented in monkfish trawlgear. This is possibly an artifact of low observer coverage." (see p. 250);
- "the observer database, while providing precise estimates for those trips that are covered, does not comprise sufficiently large samples of trips across all fisheries, gears, areas, and seasons to make reliable estimates of discards fishery wide". (see DSEIS p. 208);
- "The Councils do not propose any new bycatch monitoring programs in light of NMFS' national program under development. They do, however, recommend NMFS place sufficient observer coverage in the monkfish fishery to provide precise measurements of the amount and type of bycatch in the monkfish fishery" (see DSEIS p. 293)

Given these findings, The Ocean Conservancy urges the Councils and NMFS to increase current levels of observer coverage to assure both accurate and precise estimates of bycatch and incidental takes and to improve the admittedly lacking bycatch reporting methodology currently in place.

3. Essential Fish Habitat and Deep-water Corals

Amendment 2 to the Monkfish FMP considers a number of alternatives intended to minimize adverse impacts to Essential Fish Habitat (EFH) caused by the monkfish fishery, including areas closures and trawl design modifications. The Ocean Conservancy urges the Council to exercise its legal authority to protect two critical habitat features adversely affected by the monkfish fishery: 1) deepwater corals, and 2) tilefish burrows, particularly the tilefish HAPC.

As you know, Section 305(b)(1)(A) of the Act requires the Council and NMFS to identify and describe the adverse effects of fishing on essential fish habitat and to ensure the conservation and enhancement of essential fish habitat by minimizing these adverse effects to the extent practicable. The EFH final rule also gives the Councils the authority to protect other important habitat types not formally listed as EFH for managed species, including the deepwater corals impacted by the monkfish fishery. The *Purpose and Scope* section of the final rule (600.805 [b]) "an FMP may describe, identify, *and protect* (emphasis added) the habitat of species not in an FMU." Additionally, the response to public comments on the final rule (FR Volume 67, No 12, p. 2348) states "the preamble to the interim final rule at 62 FR 665534 notes that the Magnuson-Stevens Act does not preclude the Councils from identifying habitat (other than EFH) of a fishery resource not managed under an FMP". The Ocean Conservancy urges the Councils to exercise its legal authority to minimize impacts caused by the monkfish fishery in all habitat types, especially deepwater corals and the tilefish HAPC.

Deepwater Corals

The Ocean Conservancy supports the Council's decision to take a precautionary, proactive approach to protection of deepwater corals in the monkfish fishery. Deepwater corals are unique, vulnerable, long-lived organisms whose importance and distribution are only beginning to be fully recognized. Recent efforts to increase protections for deepwater corals, both here in the northeast and worldwide, demonstrate this fact. Consider that:

- Norway, Canada, Ireland and other countries have all initiated efforts to protect vulnerable coral habitats in recent years;
- Over 1,100 scientists issued a statement on protecting the world's deep sea coral and sponge communities in February 2004,
- The United Nations Environment Programme issued a report and Action Plan for protecting deepwater corals in June of 2004.
- Researchers in the Northeast have completed three years of exploration and mapping of deepwater corals in the Gulf of Maine, Georges Bank, and Mid-Atlantic Bight.

These efforts to identify, map, and protect deep-water corals illustrates their ecological uniqueness and need for protection. The Ocean Conservancy recognizes the critical need to take a precautionary approach to coral protection in the all fisheries (including the monkfish fishery) and supports the Council's commitment to doing so. The DSEIS clearly demonstrates the need for proactive coral protections in the monkfish fishery because 1) there is considerable overlap between the current footprint of the monkfish fishery and known coral areas (see Figures 70-71), and 2) that expansion of the offshore fishery will increase the threats to known coral areas. Specifically, the DSEIS states "if the re-establishment of an offshore directed monkfish trawl fishery is implemented, there is an increased probability of fishing effort near deepwater canyons, which could increase interactions with deep water corals" (see DSEIS p. 52) and "the monkfish fishery is one of the few fisheries that operate in deep water, and these alternatives are intended to minimize potential interactions of monkfish gear with deepwater corals". (see DSEIS p. 254)

Given these findings, we support the Councils' Preferred Alternative 5AB (Oceanographer and Lydonia Canyon closures) and Preferred Alternative 5C (up to 12 large, steep walled canyon closures). We also support Option 2 for both alternatives, which will close these areas to all gears on a monkfish DAS rather than the "trawl-gear only" proposal in Option 1.

While we support this initial effort by the Councils to protect deepwater corals, we believe additional measures are needed to assure meaningful protections for these highly vulnerable organisms. These measures should include: 1) extending protections to the "heads" of the submarine canyons containing high concentrations of corals, 2) extending protections to the deeper portions of the submarine canyons where corals are found, and 3) identifying closures in areas of high coral concentrations beyond the submarine canyons considered in this Amendment. Figure 25 in the DSEIS shows that vulnerable corals are found in many areas in Gulf of Maine, Georges Bank, and Mid-Atlantic and we urge the Council to continue to act proactively to assure these coral areas are protected before they are destroyed.

Tilefish HAPC

While The Ocean Conservancy supports the Councils' commitment to tasking initial steps to protect corals, we are deeply concerned that they propose to do nothing to protect the tilefish HAPC from impacts caused by the offshore monkfish fishery. As you know, the Gear Effects Workshop (2001) indicated that tilefish EFH is vulnerable to bottom trawling. (see DSEIS p. 72). It is also clear that the proposed offshore monkfish trawl fishery will likely occur in waters near or within areas designated as tilefish EFH. In fact, the DSEIS notes that in 1999, approximately 19% of the directed monkfish trawl fleet fished within the boundaries of the tilefish HAPC. (see DSEIS p. 289).

Given the fact that the tilefish HAPC was designated as a critically important area in 2001 and that much of the offshore fishery is expected to occur within the HAPC, we urge the Council to reconsider its decision to reject inclusion of the tilefish HAPC as a habitat closure. The Councils have a legal obligation to minimize adverse impacts to EFH and HAPCs caused by the monkfish fishery and we urge you to take the steps necessary to do so.

4. Conclusion

The Ocean Conservancy urges the Councils and NMFS to carefully consider these comments and to incorporate suggested changes into the final Monkfish FMP. Doing so will help to assure compliance with the MSA and SFA and lead to a more sustainable fishery with more meaningful habitat protection measures. We appreciate your consideration of these comments and will be glad to discuss them with you as needed.

Sincerely,

Geoffrey S. Smith
New England Fish Conservation Manager

cc:

Dr. Bill Hogarth, NMFS
Dave Borden, NEFMC
Dan Furlong, MAFMC

Subject:
Underwater Canyons
From:
"Jan Shortt" <jshort@bmts.com>
Date:
Thu, 22 Jul 2004 09:59:35 -0400 (Eastern Daylight Time)
To:
<MonkfishDSEIS@noaa.gov>

Hello: As a scuba diver, I can understand the importance of preserving the underwater life of any location. I am surprised that at the great depths of 6600 feet, the canyons would be in danger from the fishing fleets. However, I heartily support Earth Action causes to preserve the oceans for future generations. If we don't look after the marine life, the planet life will diminish.

Jan Shortt,
Owen Sound, Ontario,
Canada

Subject:
Monkfish amendment
From:
Mark and Janet Thew <mandjthew@yahoo.com>
Date:
Wed, 21 Jul 2004 14:42:03 -0700 (PDT)
To:
MonkfishDSEIS@noaa.gov

We support the closure of all twelve canyons to monkfish trawling. These are vital sealife nurseries, and should be fully protected from the damage done by the fishing industry.

Janet and Mark Thew
5572 St Francis Cir W
Loomis CA 95650

Subject:
don't approve monkfish dredging in deep water canyons
From:
Pat Berger <patberger@yahoo.com>
Date:
Thu, 22 Jul 2004 19:43:29 -0700 (PDT)
To:
MonkfishDSEIS@noaa.gov

Dear Ms. Kurkul,
I am writing because I feel strongly that the Marine Fisheries should not allow dredging or trawling for monkfish in the deep water canyons of southern New England. If we look at what has happened to the decline in fish stocks in the past few years and the restrictions that have had to be imposed on the fishing industry to prevent total loss of the stocks, it makes no sense to expand fishing to the sensitive and fragile deep water canyons. These canyons are home for deep water corals and are nursery areas for some of out important fish stocks such as hake and some species of flounder. I urge you to protect our fish stocks and prevent damage to rare corals and other deep water marine life. Please do not permit dredging or trawling for monkfish in these deep water canyons. Use common sense! As the hippocratic oath states "do no harm".
Sincerely, Dr. Patricia Downs

Subject:
Subject: Monkfish Amendment 2 DSEIS
From:
"Peter McSherry" <ninepine@comcast.net>
Date:
Fri, 23 Jul 2004 10:44:16 -0400
To:
<MonkfishDSEIS@noaa.gov>

I am sending the attached letter to Patricia Kurkul. It concerns Monkfish Amendment.

We ask you, please, to support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan, as well as choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

thanks

Peter McSherry
781-665-6829

Subject:
Public Comments Regarding Monkfish Amendment 2 DSEIS: Please Ch oose 5C-Option 2
From:
bryan.wyberg@honeywell.com
Date:
Fri, 30 Jul 2004 17:39:20 -0500
To:
MonkfishDSEIS@noaa.gov
CC:
bryan.wyberg@honeywell.com

July 28, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298
Email: MonkfishDSEIS@noaa.gov

Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

I am writing to you today because I am concerned about the failure of the United States to adequately protect and conserve its ocean resources. I am very much in favor of increased protection of significant areas of our nations water. It can only improve the situation to protect some critical areas in order to prevent a continued depletion of our ocean resources. Recent scientific studies have indicated that the deepwater canyons off the coast of southern New England contain a diversity of sensitive habitats and that destructive fishing practices, primarily trawl and gillnet monkfish fishing, cause serious impacts to these habitats. The National Marine Fisheries Service (NMFS) must only adopt new management measures for this region that protect essential fish habitat from the impacts of industrial fisheries.
Therefore I am writing to indicate that I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

This is a very reasonable management alternative that would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks

and prevent further overfishing.

Alternatively, if you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Thank you for considering my views.
Sincerely,
Bryan Wyberg
12854 Raven Street NW
Coon Rapids, MN 55448

Subject:
public comment on fed reg of 7/21/04 vol 69 no 139 page 43562
From:
jean public <jeanpublic@yahoo.com>
Date:
Mon, 26 Jul 2004 17:38:00 -0700 (PDT)
To:
da541@noaa.gov
CC:
rodney.frelinghuysen@mail.house.gov

us doc noaa id 071504b
domestic fisheries - exempted fishing permits - for special people to kill more fish - i object and oppose.

this program of special permits has gotten way out of hand so that multitudinous numbers of people all get permits to kill marine life, fish all for the same purpose. it seems to me one or two should get a permit like this, but americans dont need hordes doing the very same thing and getting special permission to do so.

I note only 16 days to respond from date of notice, which seems much too short for any real public comment. I ask for an extension of 90 days so that the national public gets a chance to comment on a national issue.

This allegedly "experimental " fishing is completely overblown and overdone. this agency has been allowing this for about fifty years now with no new forward progress from all of this "experiments". We are left more and more with too much overfishing. There is not need to grant "additional" quotas to do this since there is a quota assigned and all of this alleged "experimental" work can be fully done within quota.

It is my opinion that this allegedly "experimental" project has been turned into a scam. I want to point out now that almost every day now we have another report of an alleged "scientist" being found out to be secretly turning out results based on money, greed and profiteering. I think this alleged "science" needs another good hard look.

I SEE NO RESULTS.

B. SACHAU
15 ELM ST
FLORHAM PARK NJ 07932

Subject:
Protest to Monkfish trawling proposal
From:
JArmer1@aol.com
Date:
Thu, 22 Jul 2004 01:35:15 EDT
To:
MonkfishDSEIS@noaa.gov, rcozens@pon.net
CC:
nrdcaction@nrdc.org

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298
Email: MonkfishDSEIS@noaa.gov

Dear Ms. Kurkul:

National Resource Defense Council has just alerted me -- and others I assume -- to an urgent need for "... closure of submarine canyons to monkfish trawling proposed in the
draft Amendment 2 to the Monkfish Fishery Management Plan."

In view of this, I urge you to follow their advice:

Choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would, as I understand it, protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I vigorously suggest you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Our international oceans are undergoing a tragic and devastating "overfishing crisis." Your remedial actions here would be of tremendous assistance from many points of view.

Sincerely,

John Armer

John E. Armer, V. Chair, Sierra Club Ballona Task Force
2800 Neilson Way #1501
Santa Monica, CA 90405

jarmer1@ aol.com
Phone: (310) 452-4946
Fax: (310) 851-5186

Subject:
Protection of Essential Fish Habitat
From:
Vicki King <vicki@kingdesign.net>
Date:
Wed, 21 Jul 2004 16:55:44 -0700
To:
MonkfishDSEIS@noaa.gov

Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

Having watched area after area around the US be overfished and fish resources depleted and their habitat harmed, I urge you to support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." While it is never easy to say no to communities that rely on taking resources, it is essential to move toward a more sustainable harvest level. It also requires that areas be set aside which provide the habitat that is essential for species to reproduce. These canyons are important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Victoria A. King
7326 55th Ave NE
Seattle, WA 98115

Subject:
Monkfosh deserve to have homes
From:
Lynn Henry <lrosaj@yahoo.com>
Date:
Wed, 21 Jul 2004 20:40:12 -0700 (PDT)
To:
MonkfishDSEIS@noaa.gov

To whom it may concern,
I feel that the underwater cave homes of monkfish should be left alone, not be exploited by an administation's selfish wishes, and it's important for the fish to have their home instead of losing it to non-environmentalists that don't care.
Let's keep the U.S. government out of the caves!

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Written Comments

Late Comments Received by NEFMC
<u>after</u> July 28, 2004 due date

Advocates for Wild, Healthy Oceans

New England Regional Office
371 Fore Street #301
Portland, ME 04101

207.879.5444 Telephone
207.879.5445 Facsimile
www.oceanconservancy.org

Formerly the Center for Marine Conservation

July 26, 2004

Ms. Patricia Kurkul
Regional Administrator - Northeast Region
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

The Ocean Conservancy

Dear Pat:

Thank you for the opportunity to comment on the Draft Supplemental Environmental Impact Statement (DSEIS) on Amendment 2 to the Monkfish Fishery Management Plan (Monkfish FMP). The Ocean Conservancy has been actively involved in fisheries management issues in the Northeast for well over a decade and we have consistently advocated for the Council and NMFS to implement the measures needed to meet the Magnuson-Stevens Act requirements to end overfishing and rebuild depleted fish populations, to minimize wasteful bycatch, and to minimize adverse effects to fish habitat caused by fishing gear. Given our long-standing commitment to fish conservation in the region, we urge you to carefully consider our comments and incorporate them into the final Amendment 2 document.

The Ocean Conservancy supports many of the goals and objectives outlined in the Monkfish FMP, including 1) preventing overfishing and rebuilding overfished stocks as necessary, 2) addressing implementation problems associated with the FMP, 3) promoting improved data collection and research, 4) addressing deficiencies in meeting Magnuson Act requirements, and 5) addressing protected resource/fishery interactions – especially sea turtle/gillnet interactions.

The Ocean Conservancy also supports the efforts by the Councils and NMFS to establish more direct control over the monkfish fishery, rather than relying on measures in other management plans – including the scallop and groundfish FMPs - to meet monkfish management objectives. The DSEIS recognizes that "having a fishery that is directly controlled by regulations specific to the monkfish fishery will also allow managers to exercise more control over monkfish effort in achieving optimum yield, since that effort will no longer be indirectly, and sometimes unintentionally controlled by the regulations implemented to manage effort in multispecies or scallop fisheries". (see DSEIS p. 22). We offer the following comments to help assure that Amendment 2 to the Monkfish FMP achieves these goals and complies with the critically important overfishing, bycatch, and habitat provisions of the Magnuson-Stevens (MSA) and Sustainable Fisheries (SFA) Acts.

The Ocean Conservancy strives to be the world's foremost advocate for the oceans. Through science-based advocacy, research, and public education, we inform, inspire and empower people to speak and act for the oceans.

1. Overfishing and Rebuilding

The Ocean Conservancy supports a fundamental goal of the Monkfish FMP, which is to prevent overfishing of both the northern and southern monkfish stocks and to rebuild those populations as necessary. As you know, preventing overfishing is an overarching principle in the 1996 amendments to the MSA and National Standard 1 requires that "[c]onservation and management shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery." 16 U.S.C. § 1851(a)(1).

Given these requirements, we are concerned that the Councils are considering a number of measures to increase effort in the monkfish fishery considering the history of overfishing in this fishery and the scientific uncertainty regarding current fishing mortality rates. Consider the following facts. Monkfish populations were formally evaluated during two stock assessment workshops completed in the past five years. In 2000, Stock Assessment Workshop 31 (SAW 31) concluded that both stocks were overfished and subject to overfishing in 1999. SAW 34, reached the same conclusion in 2001 and also "advised that fishing mortality rates need to be reduced 20-40% to reach the proposed fishing mortality rate threshold and that discards should be reduced". (see DSEIS p. 8). In spite of ongoing efforts to improve our understanding of monkfish populations, the scientific consensus continues to be that the status of the stocks with respect to fishing mortality is unknown since there are no estimates of current fishing mortality. (see DSEIS p. 77).

In light of these facts, we urge the Council and NMFS adopt a precautionary approach to monkfish management. The need for a precautionary approach is especially critical since dependency on this fishery has increased due to the poor conditions in other fisheries. (see DSEIS p. 333). Given the existing situation, we are deeply concerned that the Monkfish FMP includes a number of measures to increase overall fishing effort, especially in the southern fishery management area where stock status appears to be the weakest. The DSEIS recognizes that many of these measures (including de-coupling DAS, DAS leasing, new permit qualification criteria, and actively promoting an offshore fishery in the southern area) will likely increase effort in the monkfish fishery, as well as the scallop and groundfish fishery. Consider the following statements from the DSEIS:

- "separating DAS usage requirements for Category C and D permits could result in increased directed fishing effort as a result of monkfish DAS being "freed up"...At the same time, multispecies Category C and D vessels, and to a lesser extent, scallop C and D vessels, could direct more of their effort on multispecies or scallops stocks, since they would have monkfish only DAS to target monkfish" (see DSEIS p. 238).
- "the decoupling of monkfish DAS from scallop or multispecies DAS usage requirements could result in some multispecies DAS being directed on groundfish where they otherwise would have been used on DAS targeting monkfish" (see DSEIS p. 241).
- "in the SFMA...Category C and D could increase overall effort compared to no action because they would have monkfish DAS in addition to their multispecies or scallop DAS, not in combination with their other DAS" (see DSEIS p. 246).

- "in the offshore SFMA fishery, the increased trip limits associated with the programs provide vessels with an incentive to shift effort into the areas defined". (see DSEIS p. 249)

We urge the Council and NMFS to take every step necessary to assure these measures and others do not increase overall mortality and undermine rebuilding efforts. Under the proposed plan, the Councils will continue to rely on the annual TAC adjustment process to make up for any overages caused by an effort increase in the monkfish fishery. (see DSEIS p. 239). We question the efficacy of this process to prevent overfishing on annual basis and urge the Councils to consider additional accountability measures and backstop mechanisms (i.e., annual and/or seasonal hard TACs and overage deductions) to assure that overfishing is prevented and rebuilding continues.

2. Bycatch and Observers

The Ocean Conservancy is deeply concerned that Amendment 2 fails to include adequate measures to minimize bycatch (particularly of endangered marine mammals and sea turtles) and fails to require a standardize bycatch reporting methodology as required by law. As you know, National Standard 9 requires that "conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." 16 U.S.C. § 1851(a)(9). Fishery management plans must also "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, an include conservation and management measures that . . ." minimize bycatch to the extent practicable. 16 U.S.C. § 1853(a)(11).

Despite these requirements, information presented in the DSEIS clearly demonstrates that bycatch and discards in the monkfish fishery (of both monkfish and sea turtles) continues to be a significant problem.

Monkfish Bycatch

Data presented in Table 67 shows that monkfish bycatch rates in dredge and trawl gear range from 35-43% in northern area and 27-29% in southern area. (see DSEIS p. 209). The Council has proposed measures proposed to address the problem, including changes and/or elimination of minimum fish size requirements, changes in mesh size and trawl configurations, and adoption incidental catch limits for bycatch fisheries.

We oppose the proposal to eliminate minimum fish size requirements as a way to reduce bycatch and discards. As the DSEIS recognizes "minimum fish size regulations have been widely used in FMPs on the basis that they discourage the targeting of small fish and increase yield per recruit". (see DSEIS p. 39). We agree with this conclusion and urge Council to maintain minimum fish size regulations and to match mesh size requirements and selectivity characteristics in the fishery. We understand PDT has recommended against minimum fish sizes for the fishery, citing that a significant portion of monkfish is caught as bycatch in fisheries that are not as selective as the directed fishery. However, we disagree with the PDT conclusion that "as long as small mesh and even 6-inch mesh fisheries catch monkfish, then a minimum size regulation will cause avoidable discarding of sub-legal sized monkfish." (see DSEIS p. 39).

Developing more selective fishing gear and practices is the solution to this problem, eliminating an important fisheries management tool like minimum fish sizes is not. We also see merit in the proposal to adopt uniform minimum fish size requirements in northern and southern area as long as the biology of the two stocks supports the change. Finally, we support the proposal in section 4.1.2 to adopt incidental catch limits for fisheries with significant monkfish bycatch. However, urge Council to adopt overall bycatch caps (Hard TACs) for these fisheries as well as daily trip limits, because doing so will provide real economic incentives to avoid the wasteful bycatch and discarding currently occurring in the fishery.

Sea Turtle and Marine Mammal Bycatch

Information presented in the DSEIS demonstrates that bycatch of marine mammals and sea turtles in the monkfish fishery is a significant concern. Consider the following findings:

- "It is known, however, that right, fin, humpback, and sei whales and loggerhead, green, Kemp's ridley, and leatherback sea turtles become entangles in both trawl and sink gillnet gear that is identical or similar to that used in the monkfish fishery" (see DSEIS p. 245)
- "sea turtles occur through all or most of the area in which monkfish gillnet gear is set" (see DSEIS p. 244);
- "of particular concern is the early spring monkfish gillnet fishery that occurs off North Carolina and Virginia in March through May...Although monkfish fishing effort in EEZ waters off North Carolina and Virginia is far less than elsewhere in the action area, the high concentrations of turtles in the area means there is a risk of a high level of interaction with the fishery" (see DSEIS p. 244);
- "the use of tie-downs for gillnets set in the same areas may increase the likelihood that turtles will be caught in the net" (see DSEIS p. 245);
- "the long soak time of monkfish gillnets, particularly in the Mid-Atlantic, also increase the risk of seat turtle entanglements by increasing the length of time that the net is in the water...Soak times for monkfish gillnets, in general, are greater than the submergence tolerance of sea turtles. Therefore, sea turtles are almost certainly expected to die as a result of capture in a monkfish gillnet unless the animal is caught in the net close to the surface and has the ability to breathe, or is caught immediately prior to hauling of the net" (see DSEIS p. 245);
- Under alternative 1 (decoupling of DAS), the potential for interactions with protected species in the SFMA is likely to increase: (see. P. 247). Lastly,

Given these findings and the endangered status of sea turtles in the Atlantic, we are deeply concerned that the Councils have failed to propose any specific measures to minimize sea turtle takes. Instead, the Council proposes to simply include a list of actions that can be taken to protect sea turtles and other marine mammals in some undetermined future framework adjustment process as the need arises. In fact, the DSEIS goes so far as to claim that creating a list of frameworkable items "is expected to have positive benefits for the protected species that are likely to interact with monkfish gear in the EEZ" (see DSEIS p. 250). We disagree with the conclusion that this administrative measure will have any positive benefits to protected species in the short-term and urge the Councils to take concrete steps now to address this critical problem.

The DSEIS reveals that the Council originally considered including specific measures to address the immediate problem of sea turtle catches in the large mesh gillnet fishery south of 38 N in this amendment, but chose not to do so. (See DSEIS p. 77). We urge the Council to reconsider this decision and to implement proactive measures to significantly reduce incidental takes of sea turtles and marine mammals as required by law.

<u>Observer Coverage and Bycatch Reporting Methodologies</u>

The Ocean Conservancy also urges the Council and NMFS to increase observer coverage to levels sufficient to assure both accurate and precise estimates of bycatch in the monkfish fishery. Under the current systems, managers rely almost exclusively on observer coverage in the scallop and groundfish fisheries for bycatch information in the monkfish fishery. This approach has led to inadequate information on bycatch and unreliable estimates of incidental takes of protected species in the fishery. Consider that the April 2003 Biological Opinion prepared for the monkfish fishery notes that there have been no reported or observed incidental takes of sea turtles specifically in the monkfish otter trawl fishery during any time of the year. (see DSEIS p. 245). This finding alone would suggest to fishery managers that there are no incidental takes of sea turtles in the monkfish fishery. Yet the DSEIS admits that this is not the case and that inadequate levels of observer coverage continue to be a concern. Consider the following:

- "Although bottom trawls have documented takes of sea turtles, there are none documented in monkfish trawlgear. This is possibly an artifact of low observer coverage." (see p. 250);
- "the observer database, while providing precise estimates for those trips that are covered, does not comprise sufficiently large samples of trips across all fisheries, gears, areas, and seasons to make reliable estimates of discards fishery wide". (see DSEIS p. 208);
- "The Councils do not propose any new bycatch monitoring programs in light of NMFS' national program under development. They do, however, recommend NMFS place sufficient observer coverage in the monkfish fishery to provide precise measurements of the amount and type of bycatch in the monkfish fishery" (see DSEIS p. 293)

Given these findings, The Ocean Conservancy urges the Councils and NMFS to increase current levels of observer coverage to assure both accurate and precise estimates of bycatch and incidental takes and to improve the admittedly lacking bycatch reporting methodology currently in place.

3. Essential Fish Habitat and Deep-water Corals

Amendment 2 to the Monkfish FMP considers a number of alternatives intended to minimize adverse impacts to Essential Fish Habitat (EFH) caused by the monkfish fishery, including areas closures and trawl design modifications. The Ocean Conservancy urges the Council to exercise its legal authority to protect two critical habitat features adversely affected by the monkfish fishery: 1) deepwater corals, and 2) tilefish burrows, particularly the tilefish HAPC.

As you know, Section 305(b)(1)(A) of the Act requires the Council and NMFS to identify and describe the adverse effects of fishing on essential fish habitat and to ensure the conservation and enhancement of essential fish habitat by minimizing these adverse effects to the extent practicable. The EFH final rule also gives the Councils the authority to protect other important habitat types not formally listed as EFH for managed species, including the deepwater corals impacted by the monkfish fishery. The *Purpose and Scope* section of the final rule (600.805 [b]) "an FMP may describe, identify, *and protect* (emphasis added) the habitat of species not in an FMU." Additionally, the response to public comments on the final rule (FR Volume 67, No 12, p. 2348) states "the preamble to the interim final rule at 62 FR 665534 notes that the Magnuson-Stevens Act does not preclude the Councils from identifying habitat (other than EFH) of a fishery resource not managed under an FMP". The Ocean Conservancy urges the Councils to exercise its legal authority to minimize impacts caused by the monkfish fishery in all habitat types, especially deepwater corals and the tilefish HAPC.

Deepwater Corals

The Ocean Conservancy supports the Council's decision to take a precautionary, proactive approach to protection of deepwater corals in the monkfish fishery. Deepwater corals are unique, vulnerable, long-lived organisms whose importance and distribution are only beginning to be fully recognized. Recent efforts to increase protections for deepwater corals, both here in the northeast and worldwide, demonstrate this fact. Consider that:

- Norway, Canada, Ireland and other countries have all initiated efforts to protect vulnerable coral habitats in recent years;
- Over 1,100 scientists issued a statement on protecting the world's deep sea coral and sponge communities in February 2004,
- The United Nations Environment Programme issued a report and Action Plan for protecting deepwater corals in June of 2004.
- Researchers in the Northeast have completed three years of exploration and mapping of deepwater corals in the Gulf of Maine, Georges Bank, and Mid-Atlantic Bight.

These efforts to identify, map, and protect deep-water corals illustrates their ecological uniqueness and need for protection. The Ocean Conservancy recognizes the critical need to take a precautionary approach to coral protection in the all fisheries (including the monkfish fishery) and supports the Council's commitment to doing so. The DSEIS clearly demonstrates the need for proactive coral protections in the monkfish fishery because 1) there is considerable overlap between the current footprint of the monkfish fishery and known coral areas (see Figures 70-71), and 2) that expansion of the offshore fishery will increase the threats to known coral areas. Specifically, the DSEIS states "if the re-establishment of an offshore directed monkfish trawl fishery is implemented, there is an increased probability of fishing effort near deepwater canyons, which could increase interactions with deep water corals" (see DSEIS p. 52) and "the monkfish fishery is one of the few fisheries that operate in deep water, and these alternatives are intended to minimize potential interactions of monkfish gear with deepwater corals". (see DSEIS p. 254)

Given these findings, we support the Councils' Preferred Alternative 5AB (Oceanographer and Lydonia Canyon closures) and Preferred Alternative 5C (up to 12 large, steep walled canyon closures). We also support Option 2 for both alternatives, which will close these areas to all gears on a monkfish DAS rather than the "trawl-gear only" proposal in Option 1.

While we support this initial effort by the Councils to protect deepwater corals, we believe additional measures are needed to assure meaningful protections for these highly vulnerable organisms. These measures should include: 1) extending protections to the "heads" of the submarine canyons containing high concentrations of corals, 2) extending protections to the deeper portions of the submarine canyons where corals are found, and 3) identifying closures in areas of high coral concentrations beyond the submarine canyons considered in this Amendment. Figure 25 in the DSEIS shows that vulnerable corals are found in many areas in Gulf of Maine, Georges Bank, and Mid-Atlantic and we urge the Council to continue to act proactively to assure these coral areas are protected before they are destroyed.

Tilefish HAPC

While The Ocean Conservancy supports the Councils' commitment to tasking initial steps to protect corals, we are deeply concerned that they propose to do nothing to protect the tilefish HAPC from impacts caused by the offshore monkfish fishery. As you know, the Gear Effects Workshop (2001) indicated that tilefish EFH is vulnerable to bottom trawling. (see DSEIS p. 72). It is also clear that the proposed offshore monkfish trawl fishery will likely occur in waters near or within areas designated as tilefish EFH. In fact, the DSEIS notes that in 1999, approximately 19% of the directed monkfish trawl fleet fished within the boundaries of the tilefish HAPC. (see DSEIS p. 289).

Given the fact that the tilefish HAPC was designated as a critically important area in 2001 and that much of the offshore fishery is expected to occur within the HAPC, we urge the Council to reconsider its decision to reject inclusion of the tilefish HAPC as a habitat closure. The Councils have a legal obligation to minimize adverse impacts to EFH and HAPCs caused by the monkfish fishery and we urge you to take the steps necessary to do so.

4. Conclusion

The Ocean Conservancy urges the Councils and NMFS to carefully consider these comments and to incorporate suggested changes into the final Monkfish FMP. Doing so will help to assure compliance with the MSA and SFA and lead to a more sustainable fishery with more meaningful habitat protection measures. We appreciate your consideration of these comments and will be glad to discuss them with you as needed.

Sincerely,

Geoffrey S. Smith
New England Fish Conservation Manager

cc:

Dr. Bill Hogarth, NMFS
Dave Borden, NEFMC
Dan Furlong, MAFMC

125 North Drexel Street
Woodbury, NJ 08096
July 22, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Dear Ms. Kurkul:

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals
and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least Support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond. Healthy oceans as well as a healthy fish population are very important to all of the citizens of the United States. Please do everything possible to protect them; without protections the fragile underwater environment will be destroyed.

Sincerely,

Loretta Dunne

Loretta Dunne

RECEIVED
AUG - 2 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Subject: Monkfish Amendment 2 DSEIS - Choose 5C - Option 2

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C - Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life.

The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C - Option 2, I urge that you at least support Alternative 5AB - Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Robert M. Macaux, 169 Spencer Ave
East Greenwich RI, 02818

JUL 29 2004

Caleb C. Wistar

93 Winne Road
Delmar NY 12054
(518) 439-7529
c_wistar@hotmail.com

July 26, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

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MANAGEMENT COUNCIL

July 26, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

Dear Patricia Kurkul,

Please support the closure of the submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan. I urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing.

Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch founder, and the proposed closures would help to rebuild depleted stocks and prevent further overfishing.

Help to preserve our declining oceans.

Sincerely,

Dennis Thomas

Dennis Thomas
147 St. Germain Lane
Pleasant Hill, CA. 94523

JUL 3 0 2004

Dear Ms. Kurkul:

July 24, 2004

I am in favor of closing submarine canyons to monkfish trawling as proposed in draft Amendment 2 to the Monkfish Fishery Management Plan. I support the "Essential Fish Habitat" alternative, "5 C-Option 2" that would restrict trawl and gillnet monkfish fishing from up to 12 under-200-m deep water canyons. These are homes to rare anemones and the unique tilefish, whose pueblo village homes in the canyon walls are one of those rare natural delights we have not destroyed with bottom-line consumption habits. The canyons are also essential nursery areas for overfished populations, such as halibut, white hake, & witch flounder. Closing off areas from the destructive effect of trawler fishing would help rebuild depleted stocks. At the very least, I would ask that you support alternative 5AB-Option 2, which would cordons off Oceanographer and Lydonia canyons.

Please promote responsible and sustainable stewardship of our oceans. Only by doing this now, ~~at~~ on land and ~~at~~ sea, can we hope to leave anything for the ever-populous generations to come.

Thank you for your time,

JUL 3 0 2004

[illegible]

1220 Pinetree Dr.
Frazier Park CA

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NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-22

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2."

Our fisheries are in acute decline. The closure of these submarine canyons would aid in the return of overfished populations. Depleted species need a chance and a place to rebuild. These canyons offer that.

While I am writing from California I have spent much time on the Massachusettes coast as my son lived in Arlington for eight years. We spent time on most visits on Cape Anne because we all love the ocean and my husband's grandmother grew up in Gloucester. Her father was a spar maker in the nineteenth century. So there is a strong connection to the New England sea.

I am a retired school teacher. I am a volunteer educator at The Marine Mammal Center in Sausalito California. I instruct school children and adults about issues related to marine mammals and the state of the ocean. I do this work because I care deeply about the health of our oceans and the creatures that live in them. I consider myself well-informed in the issues surrounding fisheries management and depleted species.

If you do not choose Alternative 5C-option2, I urge you to support Alternative 5AB-Option2 which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Thank you for your attention.

Elizabeth Leite 7/25/04

Mrs. Elizabeth Leite
77 Willow Avenue
Walnut Creek, CA 94595

JUL 3 0 2004

SFD

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NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Therese Patton
David Patton
PO Box 272
Angel Fire, NM 87710

Dear Ms. Kurkul:

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are over-fished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further over-fishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing. Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Therese Patton

Therese Patton

David Patton

David Patton

ECEIVE
AUG - 2 2004

SFD

Michelle Harrington

65 S Washington St, Apt 204, Denver, Colorado 80209

July 29, 2004

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930

RECEIVED
AUG - 6 2004
NEW ENGLAND FISHERY
MANAGEMENT COUNCIL

Subject: Close Submarine Canyons to Monkfish Trawling

Dear Ms. Kurkul:

I support the closure of the submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2". This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing.

Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake, and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Michelle Harrington

Michelle Harrington

RECEIVE
AUG - 2 2004

Pamela L. Morgan
400 Morgan Street
Madisonville, LA 70447
(formerly of New York)

7/26/04

Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298
Subject: Monkfish Amendment 2 DSEIS - Choose 5C-Option 2

Dear Ms. Kurkul,

I support the closure of submarine canyons to monkfish trawling proposed in the draft Amendment 2 to the Monkfish Fishery Management Plan and urge you to choose the "Essential Fish Habitat" alternative designated "5C-Option 2." This alternative would close up to 12 of the deepwater canyons in areas below 200 meters to trawl and gillnet monkfish fishing. Closing these canyons would protect designated essential fish habitat for multiple fish species, as well as protect the eastern seaboard's most significant assemblages of deepwater corals and other marine life. The canyons are also important nursery areas for a number of fish populations that are overfished, such as halibut, white hake and witch flounder, and the proposed closures would help rebuild depleted stocks and prevent further overfishing.

If you do not choose Alternative 5C-Option 2, I urge that you at least support Alternative 5AB-Option 2, which would close Oceanographer Canyon and Lydonia Canyon to trawl and gillnet monkfish fishing.

Please support these components of Amendment 2 to the monkfish plan and preserve our ocean environment for this generation and beyond.

Sincerely,

Pamela Lopez Morgan

Pamela L. Morgan

NRDC
THE EARTH'S BEST DEFENSE

Natural Resources Defense Council
40 West 20th Street
New York, NY 10011
Tel: (212) 727-2700
Fax: (212) 727-1773

September 29, 2004

Via electronic mail and facsimile

Mr. Daniel T. Furlong
Executive Director
Mid-Atlantic Fishery Management Council
Room 2115 Federal Building
300 S. New Street
Dover, DE 19904

Re: Monkfish Amendment 2

Dear Dan:

The Natural Resources Defense Council ("NRDC") respectfully submits this letter in support of "Essential Fish Habitat" ("EFH") "Alternative 5AB" in Amendment 2 to the Monkfish Fishery Management Plan ("FMP") and the supporting draft supplemental environmental impact statement ("DSEIS"). NRDC is an environmental organization that represents more than 550,000 members around the country.

In July, NRDC submitted comments to the National Marine Fisheries Service ("NMFS") in support of EFH Alternative 5C, as well as Alternative 5AB as a less preferred alternative. While Alternative 5AB proposes to close two canyons, Oceanographer and Lydonia, Alternative 5C proposes to close up to 12 deepwater canyons in areas below 200m. The DSEIS states that Alternative 5C will protect EFH because the hard substrate and steep walls of the canyons serve as critical habitat for significant numbers of deepwater corals, including some of the largest known assemblages of such corals on the Atlantic coast. Closure of the canyons would protect these deepwater corals colonies from the destructive impacts of bottom trawling for monkfish.

For the reasons discussed in further detail below, NRDC strongly supports both Alternative 5C and Alternative 5AB for the purpose of protecting deepwater corals. In addition, as also discussed below, NRDC supports both alternatives because they will help prevent the overfishing of monkfish and other depleted species, ensure the timely rebuilding of several depleted stocks, protect designated essential fish habitat for several stocks, and minimize bycatch and bycatch mortality of corals, sponges, and depleted fish stocks such as white hake, redfish, and witch flounder. We note that the DSEIS fails to adequately discuss these additional significant benefits of, and legal bases for, these proposed actions, and we request that the DSEIS be revised prior to finalization to incorporate the necessary discussion.

As you know, the New England Fishery Management Council ("NEFMC") did not approve Alternative 5C at its meeting earlier this month. It did, however, approve the more limited closures provided for in Alternative 5AB. In light of the NEFMC's action, we support the MAFMC moving forward and similarly approving Alternative 5AB at this time. This action would close two canyons, Oceanographer and Lydonia, to monkfish fishing. NRDC continues to support protecting additional deepwater canyons and their important resources, and we look forward to working with the councils and NMFS towards this goal.

In the meantime, approval of Alternative 5AB would be a significant advance. Oceanographer and Lydonia canyons contain extensive numbers of hard and soft corals. Indeed, Oceanographer canyon is believed to contain between 20 to 50 percent of all deepwater corals on Georges Bank. Both Oceanographer and Lydonia are believed to serve as a larval source for other areas on the continental shelf. The location of Oceanographer and Lydonia canyons relatively close to major ports make them prime candidates for exploitation and, therefore, prime candidates for closure.

Benefits of Protecting the Deepwater Canyons

Alternative 5C and, to a lesser extent, Alternative 5AB would have the following conservation benefits:

1. Protection of the deepwater canyons will help satisfy legal requirements to end overfishing and rebuild stocks as quickly as possible. In the early 1990s, high monkfish mortality coupled with low stock biomass triggered the development of the Monkfish Fishery Management Plan. Both the northern and the southern monkfish stocks were overfished and subject to overfishing. In 1999, NMFS finalized the Monkfish Fishery Management Plan, the stated purposes of which included stopping overfishing and rebuilding the monkfish stock. See 64 Fed. Reg. 54732. The FMP divided the stock into two management areas, the Northern Fishery Management Area ("NFMA") and the Southern Fishery Management Area ("SFMA"). The FMP was designed to halt overfishing in 2002 and allow rebuilding of the stock in both the NFMA and SFMA to the stock biomass targets by 2009.

   By fishing year 2003, overfishing of monkfish had ended in the NFMA but not in the SMFA. Absent additional conservation measures, overfishing is likely to continue to occur in the SFMA. Moreover, absent additional conservation measures, monkfish are unlikely to be rebuilt by 2009, as required.

   The best available science indicates that the remote canyon areas currently serve as refuges for significant concentrations of monkfish. According to the NMFS monkfish survey, monkfish are concentrated on the edge of the continental shelf where the canyons are located. (E.g., DSEIS – pg 75) The 2001 cooperative monkfish survey covered deeper waters than the NMFS monkfish survey and confirmed a concentration of monkfish along the continental shelf and in the canyon areas. (E.g., DSEIS – pg 76).

The need for protecting the canyons as refugia will be even greater if certain management actions described in the DSEIS are adopted. For example, the proposed offshore SFMA monkfish fishery would establish a separate set of regulations for vessels fishing in the offshore waters of the SFMA. This offshore monkfish fishery would effectively incorporate a "running clock" into the FMP and would increase the pressure on the southern stock. Depending on the specific area chosen, the offshore SFMA fishery would overlap with at least seven canyons, including Oceanographer, Hydrographer, Vetach, Atlantis, Hudson, Wilmington, Baltimore, and could encompass as many as ten canyons including (in addition to the just named canyons) Heezen, Lydonia, and Gilbert.

In future years, in part because of such management actions like the proposed creation of the offshore SFMA fishery, it is likely that the monkfish fleet will expand fishing intensity further offshore, including into the canyons. The larger, commercial net used in the cooperative survey and designed for efficiently catching monkfish is just one signal of the feasibility of a directed monkfish fishery along the continental shelf and in the canyons. Accordingly, protection of the canyons would (1) provide necessary additional conservation benefits to the existing set of management measures, and (2) balance the increased exploitation that would result from implementation of such management initiatives as the offshore SFMA fishery, as well as the more generalized expansion of the monkfish fishery into offshore areas, including the canyons.

The deepwater canyons closures would also provide substantial benefits to certain other overfished stocks that are in need of additional conservation measures. Specifically, portions of the canyons are designated EFH for white hake and redfish. White hake juveniles and adults have EFH designated to 325 meters into the submerged canyons. Similarly, redfish juveniles and adult have EFH that extends 350 meters into Heezen, Lydonia, Gilbert, Oceanographer, and Hydrographer canyons. Because of the adverse habitat impacts of bottom trawling, as discussed infra, protecting the canyons from expanded bottom trawling in a directed monkfish fishery will benefit these stocks' rebuilding and reduce overfishing.

2. Closures of the canyons will protect EFH from adverse fishing gear impacts and are practicable. Many managed fish stocks have EFH that overlaps with the canyon areas proposed for closure. The canyons specifically serve as foraging and breeding habitat for a number of heavily exploited species common to the outer shelf and upper slope. Moreover, the canyons encompass significant habitat for a variety of fish populations that are caught incidentally in, or otherwise harmed by, commercial fishing, including specifically by use of bottom trawl gear.

For example:

a. White Hake: Juvenile and adult white hake have designated EFH in bottom habitats with a substrate of mud or fine-grained sand up to 325 meters. According to DSEIS, the juvenile white hake EFH has a moderate vulnerability to trawl gear. The white hake juvenile and adult EFH habitats overlap with the following canyons: Heezen, Lydonia, Gilbert, Oceanographer, Hydrographer, Vetach, Atlantis and Hudson.

b. Redfish: Juvenile and adult redfish have designated EFH in bottom habitats with a substrate of silt, mud or hard bottom to 350 meters (adults) and 400 meters (juveniles). The juvenile EFH is considered to have a high vulnerability to trawl gear and the adult EFH to have a moderate vulnerability to trawl gear. Habitat vulnerability from otter trawls in boulder habitats is considered high because gear can overturn boulders and reduce the number of crevices as well as dislodge cerianthid anemones from the bottom. The redfish juvenile and adult EFH habitats overlap with the following canyons: Heezen, Lydonia, Gilbert, Oceanographer, and Hydrographer.

c. Barndoor Skate: Juvenile and adult barndoor skate have designated EFH in mudbottom and sand and gravel to 750 meters. Juvenile and adult barndoor skate EFH is considered to have a moderate vulnerability to trawl gear. Juvenile EFH is considered to be moderately vulnerable to otter trawls and scallop dredges because of the closer association of juveniles to a benthic invertebrate diet. Adult EFH vulnerability to otter trawls and scallop dredges is considered to be moderate due primarily to the skate's reproductive habits. The barndoor skate juvenile and adult EFH habitats overlap with the following canyons: Gilbert, Oceanographer, Hydrographer and Atlantis.

d. Witch Flounder: Juvenile and adult witch flounder have designated EFH in bottom habitats with fine grained substrate and along the outer continental shelf to 300 meters (adults) and 450 meters (juveniles). Juvenile and adult witch flounder EFH have moderate vulnerability to trawl gear. The witch flounder juvenile and adult EFH habitats overlap with the following canyons: Heezen, Lydonia, Gilbert, Oceanographer, Hydrographer, Vetach, Atlantis, Hudson, Wilmington, Washington, and Norfolk.

e. Red Deep-sea Crab: Juvenile red deep-sea crab has designated EFH in smooth-surface silt-clay between 700 and 1800 meters. Adult red deep-sea crab has designated EFH in silty and hard sediments between 200 and 1300 meters.

Monkfish trawling would have a negative impact on the bottom habitat that forms EFH for these and other species and makes these canyons so unique. As documented by the National Academy of Sciences and otherwise supported by the best available science, trawling reduces habitat complexity. The direct adverse effects of trawling include loss of erect and sessile epifauna, smoothing of sedimentary bedforms and reduction of bottom roughness, and removal of taxa that produce structure. Trawl gear can crush, bury, or expose marine flora and fauna and reduce structural diversity.

The best available science also indicates that fauna that live in low natural disturbance regimes like the deepwater canyons are more vulnerable to fishing gear disturbance. Habitats consisting of unconsolidated sediments that experience high rates of natural disturbance can have more subtle responses to trawling than habitats characterized by boulders or pebbles. Epifaunal communities that stabilize sediments, reef-forming species, or fauna in habitats that experience low rates of natural disturbance have been observed to be particularly vulnerable. Likewise, softbodied, erect, sessile organisms are more vulnerable to mobile gear than are hard-bodied prostrate organisms.

The best available science also shows that trawling reduces habitat complexity as a result of the removal of sessile epifauna and the alteration of physical structure, such as rocks and cobble. Emergent epifauna, such as sponges, hydroids, and bryozoans, provide habitat for invertebrates and fishes. Disturbance of emergent epifauna is believed to increase the predation risk for juvenile fish. Decreased prey abundance increases the foraging time for juvenile fish, thus exposing them to higher predation risk.

The Magnuson Stevens Act, section 303 (a)(7), requires that adverse impacts from fishing activities on EFH be minimized to the extent practicable. As shown by the DSEIS, the proposed canyon closures – even the broader set encompassed in Alternative 5C -- are practicable. According to the DSEIS, a total of only 9 trawl trips would be affected, based on 1999 data; less than 3 trips would be affected, based on 2001 data. An additional 21 gillnet trips would be affected, based on 2001 data.

3. <u>Closing the deepwater canyons would reduce bycatch, including bycatch of deepwater corals, and is practicable.</u> Monkfish trawling along the canyon slopes and in areas of hard substrate would inevitably result in the bycatch of canyon fish species, including deepwater corals. Many species of deepwater corals are considered particularly vulnerable to harm from fishing activities, including direct physical harm and indirect harm resulting from changes in the water column and alteration of adjacent environment. Bottom trawling specifically is able to devastate extensive patches of corals. Generally, these sessile animals are most concentrated in the middle depth range, and can be found on the walls, flanks, and axis of the canyons.

Unfortunately, recovery of canyon megafaunal communities from disturbances is predicted to be considerably slower than that of slope assemblages. Based on aging data, deepwater corals in particular can be hundreds to thousands of years old, and are extremely slow to recover from harm. The vulnerability of these fish populations is further enhanced by the fact that many of these species are rare and restricted to relatively uncommon areas of exposed hard substrate. Loss of and harm to canyon populations of these organisms would represent a significant, long-term adverse impact. Since most of these species are sessile, and thus depend on "larval recruitment" to recolonize perturbed areas, loss of local canyon populations might represent loss of "stock" populations for recolonizations. For example, the larger coral and anemone populations of Oceanographer Canyon are considered to be valuable communities both as refuges and as suppliers of larvae to more disturbed areas in the region.

National Standard 9 requires that "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." The closures would minimize the bycatch of corals and other fish species by restricting the introduction of new fishing gear in the canyons, thereby reducing the interaction between fishing gear and the sensitive canyon environment, including the deepwater corals. Based on current exploitation information summarized <u>supra</u> in the discussion of the practicability of protection of EFH from adverse gear impacts, the closures are practicable for purposes of minimizing bycatch and bycatch mortality.

* * * *

NRDC appreciates the opportunity to comment on Amendment 2 and the DSEIS.

Very truly yours,

Bradford H. Sewell
Senior Attorney

cc: Patricia Kurkul, Northeast Regional Administrator
National Marine Fisheries Service
One Blackburn Drive
Gloucester, MA 01930-2298

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
David V.D. Borden, *Chairman* | Paul J. Howard, *Executive Director*

Monkfish Amendment 2

Comments

Late Comments Received:
9 Generic Letters

RECEIVED
JUL 29 2004
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Public Comment
On Amendment 2

I disagree with the "preferred" alternatives to Decision 1, DAS Alternative 1 and DAS Alternative 1b, to decouple Monkfish DAS from Scallop or Multispecies DAS usage.

These alternatives could have many negative impacts on the fishery for monkfish, as well as multispecies, for the following reasons. The "freed up" DAS would allow multispecies vessels to pursue ground fish <u>and</u> monkfish on their multispecies DAS with no trip limit on monkfish in the northern area. This is the current regulation.

The same vessel would then be allowed to pursue monkfish again while using monk only DAS, the combined pressure on monkfish will be enormous.

The directed scallop vessels with monk permits will also be catching monk while on a Scallop DAS, then can shift effort on monkfish directly with their separate Monkfish DAS.

These Monkfish DAS if unused can be leased to other vessels that are currently directing on monk, creating even more pressure.

These proposed measures "while being attractive to those who stand to gain" will no doubt create more effort on monkfish, this will in time, take away DAS from those fisherman who fish exclusively in the Southern area. The current regulation allows a 450-550 lb. trip limit and 28 DAS in the southern area. This reduction is reflective of the current fishing effort on monkfish.

The combination of increased fishing effort and probable DAS reductions makes these alternatives inequitable and unacceptable.

Constance K. Souza
F/V. Southern Hunter
Per. # 650320

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Monkfish Amendment 2

Comments

Late Comments Received:
48 Emails

comments

From: marnieorouke@yahoo.com
Sent: Thursday, July 29, 2004 7:39 PM
To: comments@nefmc.org
Subject: Please support NEFMC Preferred Alternative 5AB, option 1

Dave Borden

Dear Dave Borden,

I support the creation of no-trawl zones in marine areas that contain fragile, and slow-growing deep-sea corals. I support the New England Council's Preferred Alternative (5AB, option 1) in Monkfish Amendment 2 to protect fragile deep-sea corals in two deep-sea canyons on Georges Bank - Oceanographer and Lydonia canyons - from bottom-trawling by fishermen catching monkfish. This is a proactive first step to protect New England deep-sea corals from the expanding offshore monkfish trawl fishery.

Thank you for considering these comments.

Sincerely,

Mary L Lannon
591 Center Road
Hillsboro, New Hampshire 03244

cc:
Governor Craig Benson
Dr. William Hogarth